

PLM310

Preventive Maintenance and Service

mySAP ERP Operations: Support

Date _____
Training Center _____
Instructors _____
Education Website _____

Participant Handbook

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Course Duration: 3 Day(s)
Material Number: 50081042



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About This Handbook

This handbook is intended to complement the instructor-led presentation of this course, and serve as a source of reference. It is not suitable for self-study.

Typographic Conventions

American English is the standard used in this handbook. The following typographic conventions are also used.

Type Style	Description
<i>Example text</i>	Words or characters that appear on the screen. These include field names, screen titles, pushbuttons as well as menu names, paths, and options. Also used for cross-references to other documentation both internal (in this documentation) and external (in other locations, such as SAPNet).
Example text	Emphasized words or phrases in body text, titles of graphics, and tables
EXAMPLE TEXT	Names of elements in the system. These include report names, program names, transaction codes, table names, and individual key words of a programming language, when surrounded by body text, for example SELECT and INCLUDE.
Example text	Screen output. This includes file and directory names and their paths, messages, names of variables and parameters, and passages of the source text of a program.
Example text	Exact user entry. These are words and characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Pointed brackets indicate that you replace these words and characters with appropriate entries.

Icons in Body Text

The following icons are used in this handbook.

Icon	Meaning
	For more information, tips, or background
	Note or further explanation of previous point
	Exception or caution
	Procedures
	Indicates that the item is displayed in the instructor's presentation.

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Course Overview

The intensive training course *PLM310 - Preventive Maintenance and Service* goes into more depth about the preventive maintenance topics covered in *PLM300 Plant Maintenance*.

It demonstrates further-reaching functions for task lists and time-dependent maintenance planning.

It also describes performance-dependent and condition-dependent maintenance.

The required Customizing settings are also described.

Target Audience

This course is intended for the following audiences:

- Project leader
- Project team

Course Prerequisites

Required Knowledge

- PLM300 Maintenance

Recommended Knowledge

- SAP01
- SAPPLM



Course Goals

This course will prepare you to:

- Schedule work
- Carry out maintenance planning



Course Objectives

After completing this course, you will be able to:

- Create task lists

- Create and schedule time-dependent and performance-dependent maintenance plans
- Make the Customizing settings required for task lists and maintenance planning

SAP Software Component Information

The information in this course pertains to the following SAP Software Components and releases:

Unit 1

Course Overview

Unit Overview

This unit provides an overview of the course.



Unit Objectives

After completing this unit, you will be able to:

- Describe the structure of the course

Unit Contents

Lesson: Course Overview2

Lesson: Course Overview

Lesson Overview

This unit provides an overview of the course.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the structure of the course

Business Example

Course Overview

Main Business Scenario

To minimize downtimes and repair costs, the technical systems in the company are checked and maintained at regular intervals.

This preventive maintenance is performed based on time, performance or the condition of the technical object.

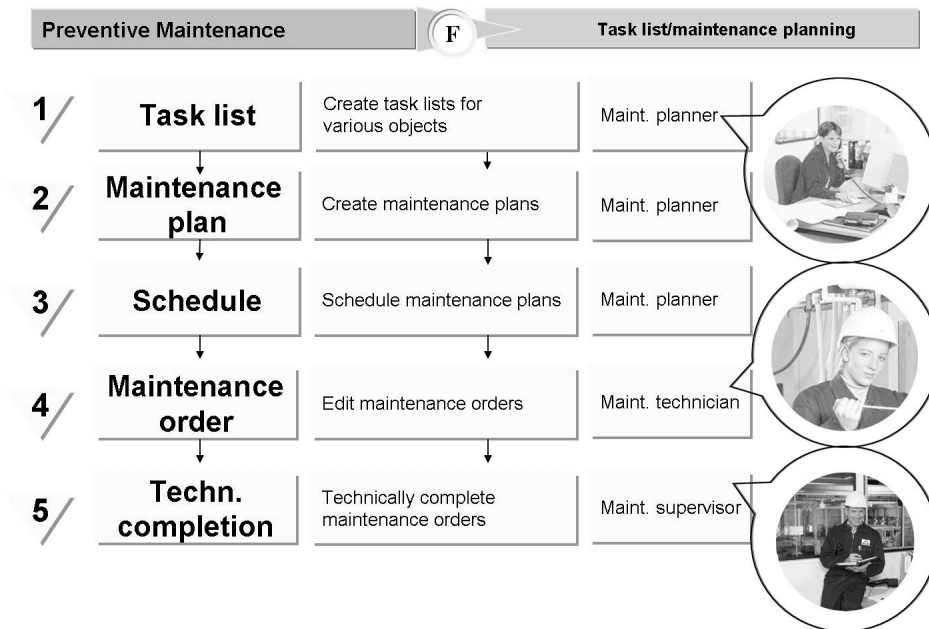


Figure 1: Process for preventive maintenance

Step 1: The task list defines the steps to be carried out on an object-dependent or object-independent basis.

Step 2: The maintenance plan is created for the object and is used to automatically generate orders (and also notifications and service entry sheets) on the basis of certain specifications.

Step 3: Scheduling is used to regularly call orders (notifications, or service entry sheets) and to recalculate planned dates.

Step 4: The maintenance order is automatically generated from the maintenance plan and included in the order list, from where it is processed like other orders.

Step 5: Technical completion flags the order as complete and also flags the planned date in the maintenance plan as complete. The date of technical completion or the completion date is used in the maintenance plan to calculate the next planned date.



Lesson Summary

You should now be able to:

- Describe the structure of the course



Unit Summary

You should now be able to:

- Describe the structure of the course

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Unit 2

Management of Task Lists

Unit Overview

This unit follows on from unit *Preventive Maintenance* in course PLM300, and recaps terminology and concepts relating to task lists and maintenance planning.



Unit Objectives

After completing this unit, you will be able to:

- Create task lists
- Assign material, PRTs and so on, to operations
- Manage where-used lists
- Make mass changes
- Analyze costs
- Copy task lists into orders
- Describe the functions of configurable general maintenance task lists
- Make the most important Customizing settings for task lists

Unit Contents

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Lesson: Task List Management

Lesson Overview

This lesson shows the detailed functions of work scheduling and the required Customizing settings.



Lesson Objectives

After completing this lesson, you will be able to:

- Create task lists
- Assign material, PRTs and so on, to operations
- Manage where-used lists
- Make mass changes
- Analyze costs

Business Example

In the company, specific maintenance work should be performed for all pumps at regular intervals. This work consists of a series of standard operations (for example, switching off, safety check, disconnecting power supply of pump and so on). Therefore, these operations are grouped together in one task list, which can be used repeatedly for different maintenance orders.

Maintenance functions

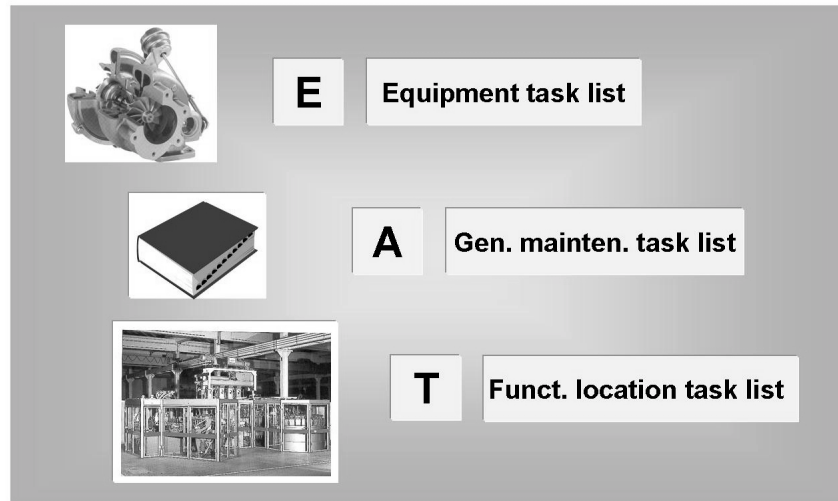


Figure 2: Task list types in plant maintenance

Three types of task lists are available. They are distinguished by an indicator:

- Equipment task list (**E**)
- Functional location task list (**T**)
- General maintenance task list (**A**)

Equipment task lists are always object-based and created for a specific, individual piece of equipment (example: steps for calibrating measuring device M-105).

Task lists for functional locations are also object-related and created for a specific functional location (example: steps for inspecting hydraulic press HP-200).

General maintenance task lists are general task lists without object reference (example: general steps for pump maintenance).

All three task list types can be used for routine and preventive maintenance.

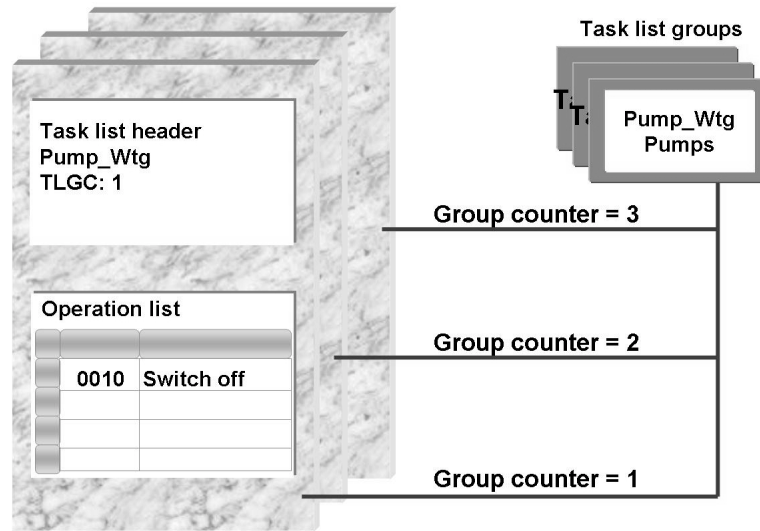


Figure 3: Organization of maintenance task lists

The maintenance task lists are grouped together into **task list groups**. A task list group contains all the maintenance task lists with the same or similar maintenance steps. The maintenance task lists within a task list group are identified by the **group counter**, which numbers the task lists within the group sequentially.

Depending on the task list type, task list groups are either object-based (equipment task lists, task lists for functional locations) or object-independent (general maintenance task lists).

For example:

- Task list group 1 for measuring device M-105
 - Task list no.1 - Steps for inspecting measuring devices
 - Task list no.2 - Steps for calibration
- Task list group PUMP_WTG for pump maintenance
 - Task list no. 1 - Steps for pump inspection
 - Task list no. 2 - Steps for exchange of gears
 - Task list no. 3 - Steps for maintaining pump motor

All the maintenance task lists within a group are handled as one unit. Therefore, it is advisable to divide your maintenance task lists into several small groups to facilitate processing. The data volume that the system has to process when accessing a task list group will thereby be reduced and system response times will be shorter.

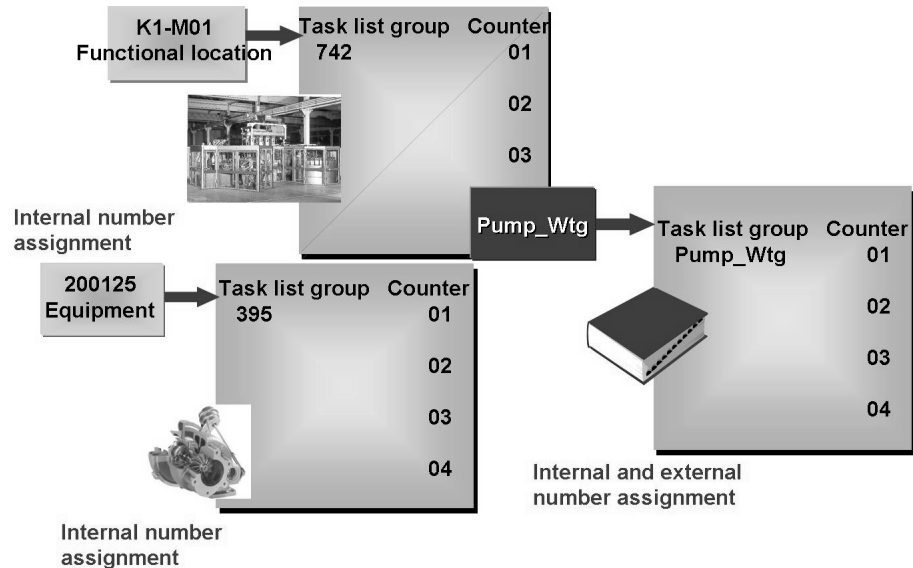


Figure 4: Number assignment for maintenance task lists

Number assignment for equipment task lists and task lists for functional locations

The numbers for equipment task lists and task lists for functional locations are assigned internally. This means that the system assigns the number when you create the task list and informs you of the number under which the task list is saved. The first task list that you create for a particular piece of equipment or functional location is identified by a task list group number and group counter. Further task lists for the same piece of equipment are identified by the task list group counter within the group.

Number assignment for general maintenance task lists

The numbers for general maintenance task lists can be assigned internally or externally.

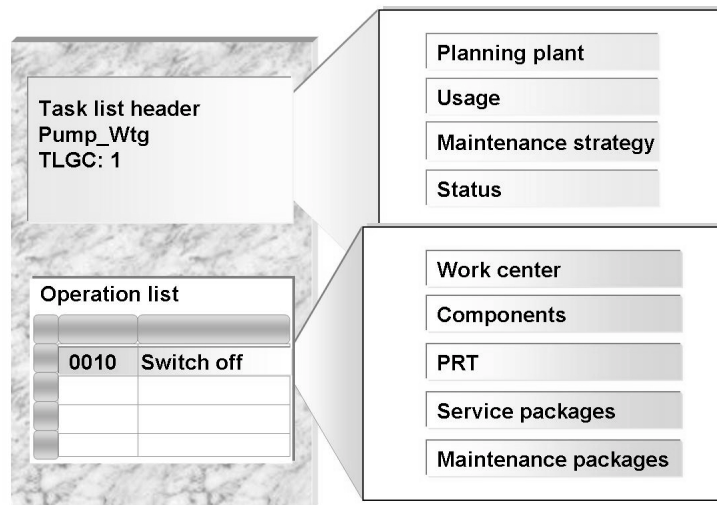


Figure 5: Structure of maintenance task lists

The following assignments are basically made in the **task list header**:

- Plant
- Work center
- Planner group
- Maintenance strategy
- Assembly
- QM data
- Status

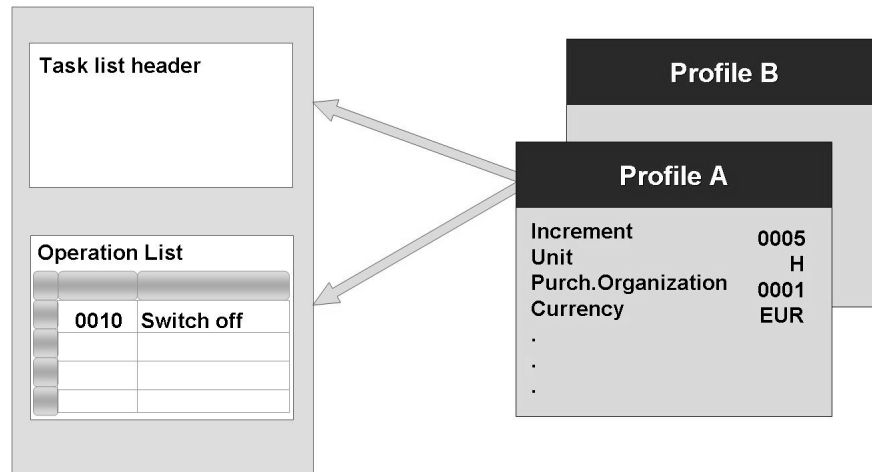


Figure 6: Profile for maintaining maintenance task lists

Particular fields in different maintenance task lists very often contain the same values or data. To reduce the time required to fill out these fields, you can create a **profile**. A profile contains standard information, which is required in the same or similar combinations during the processing of maintenance task lists.

When you create a task list, you can specify the key for the profile, which contains the required data, on the initial screen. This data is automatically entered in the new maintenance task list. The profile data can be overwritten at any time.

Profiles are maintained in **Customizing**. You use the parameter ID PIN to pre-set a default profile in the user parameters.



Caution: The profile, which is specified when a task list is created or changed, is not part of the task list and is not saved. If an existing task list is changed, the profile must be reselected.

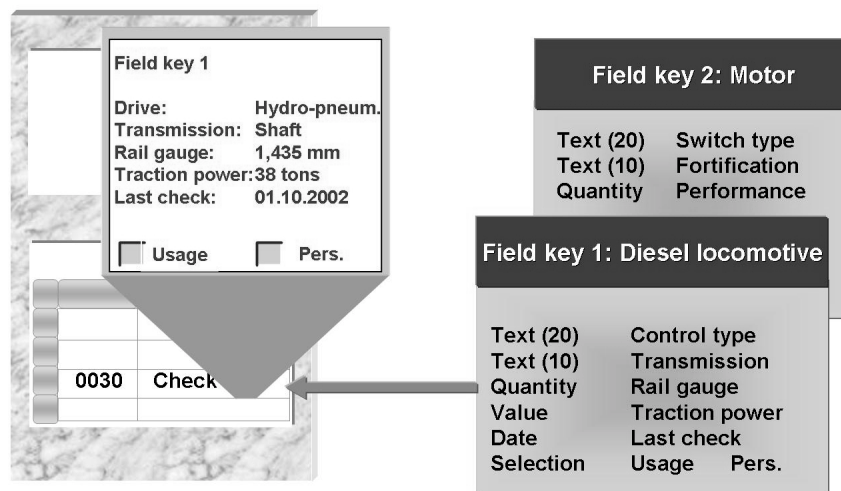


Figure 7: User fields in the maintenance task list

User fields constitute additional, user-specific data in the maintenance task list that are assigned at **operation level**.

User fields are maintained in **Customizing**.

User fields are:

- 10- or 20-character text fields
- Quantity fields
- Value fields
- Date fields
- Selection fields

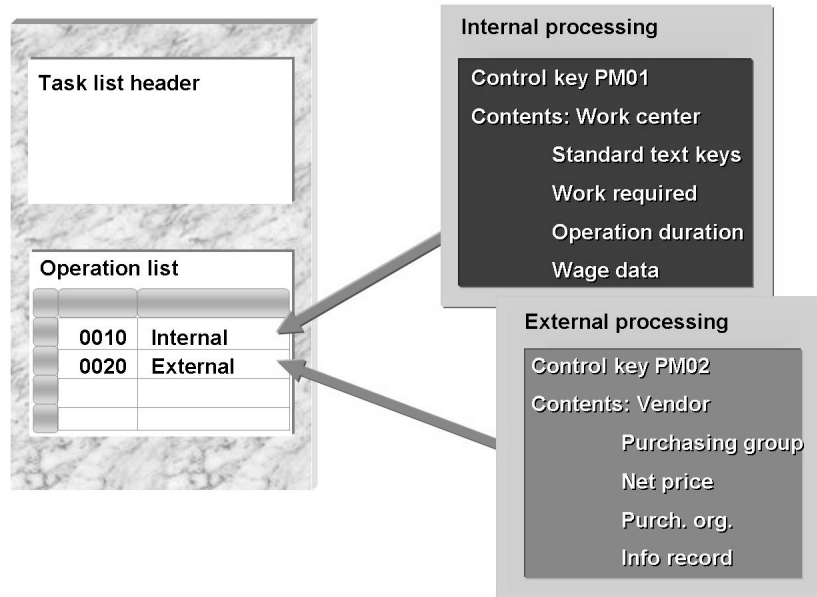


Figure 8: Control of Operations

The control key defines whether an operation is to be processed internally or externally.

Additional control parameters are set that are important for operation processing, for example, if the operation should be;

- included in scheduling?
- subject to costing?
- confirmed?
- printed?
- and others

Control keys are maintained in Customizing.

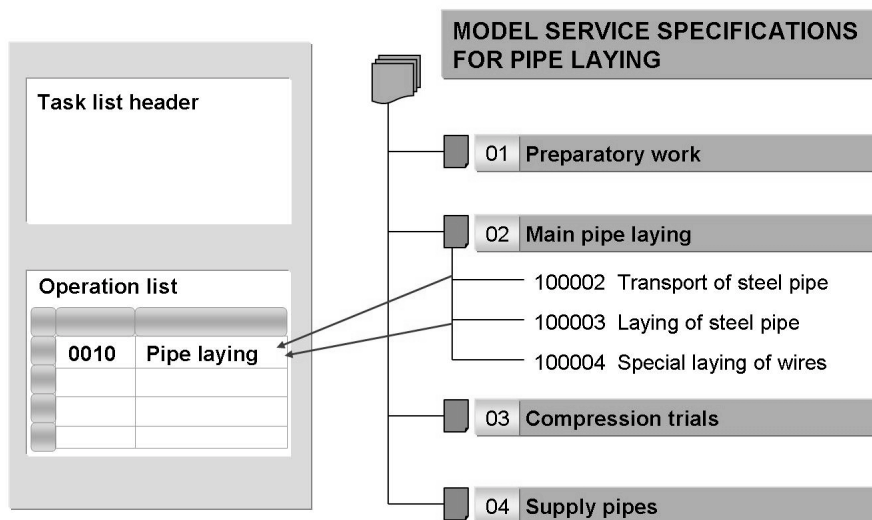


Figure 9: Service Packages in Task List

Services can be assigned to an operation in the task list as service packages (= service master records). You create and maintain service masters in Materials Management (MM-SRV).

There are two possible scenarios: Services for operations **processed externally** and services for operations **processed internally**. In both cases, a specific **control key** is set up and assigned to the operation.

You can assign service packages to the operation either by entering an individual service number or by selecting one or more services from the **standard or model service specifications**.

In addition to using service packages, services can also be entered manually in the service specifications for the operation. However, all details such as price, unit of measure and description must be entered manually.

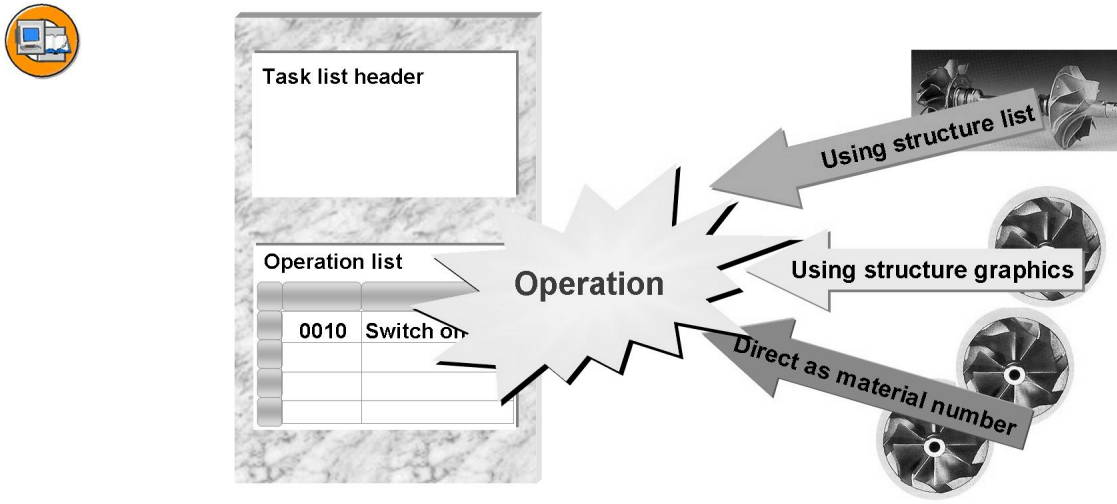


Figure 10: Component assignment in the maintenance task list

You can assign **material components** to the operations in maintenance task lists. On the one hand, you can retrieve these material components from the **bill of material** for the maintenance object (equipment, functional location or header assembly) that is assigned to the maintenance task list. In this case, the bill of material corresponds exactly to the content of the structure list.

On the other hand, you can assign stock materials, which are not listed in the bill of material for the maintenance object, directly to the maintenance task list. This is termed a **free material assignment**. The assignment is made using the material number. To make a free material assignment, you must specify a BOM usage (generally use in Plant Maintenance) in Customizing (Control Data for Task Lists). If you make a free assignment, the system then creates an **internal bill of material**. This cannot be processed from the application.

The material components assigned to the maintenance task list are copied into the maintenance order when the maintenance task list is expanded in the maintenance order.

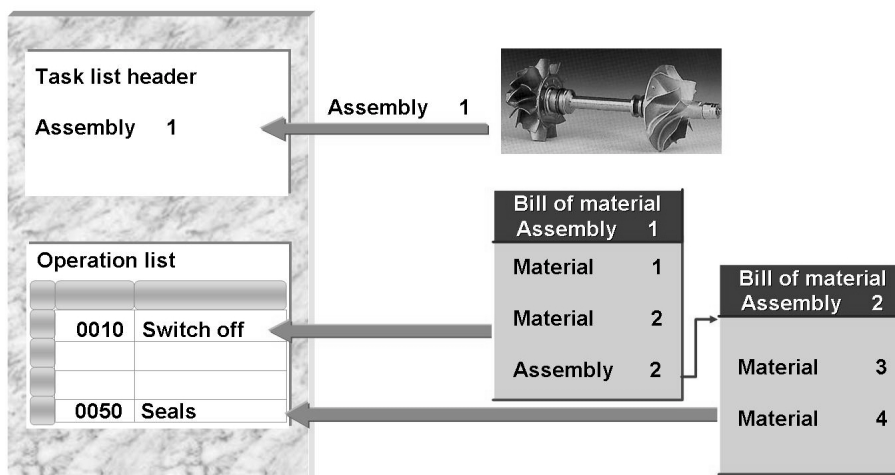


Figure 11: Component assignment in the general maintenance task list

Material components in the general maintenance task list are assigned using the assembly in the general task list header. To assign material components to a general maintenance task list, you must first enter an assembly in the general task list header.

You can assign material components to a general task list from the bill of material for the assembly (assembly 1), the bill of material for the sub-assembly (assembly 2) or from the general list of materials.

You can only change the assembly in the maintenance task list header if all the components used for the operations can be deleted.

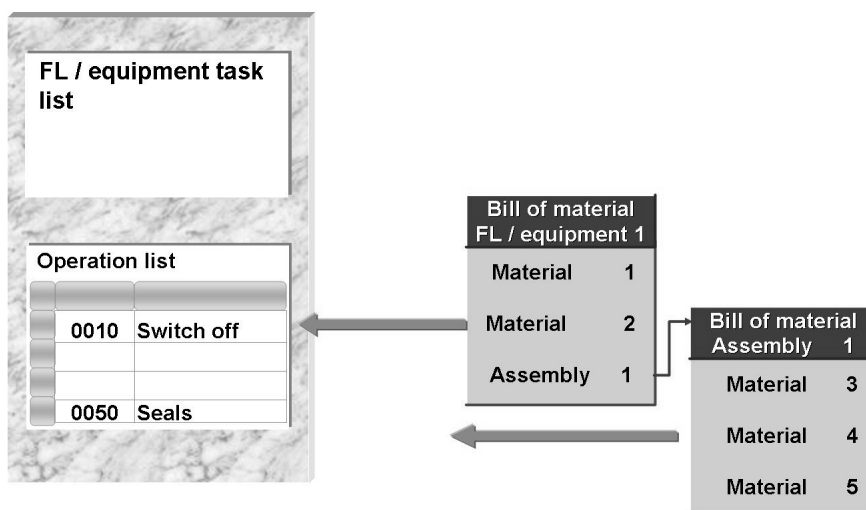


Figure 12: Component assignment in FL/equipment task lists

You can assign material components from the bill of material for the functional location/equipment or from the bill of material for subassemblies to task lists for functional locations/equipment.

The material components that you want to assign to an equipment task list or functional location task list do not have to be available in the respective bill of material when the assignment is made. You can also assign stock material freely.

The system does not automatically add the freely assigned material to the bill of material. The initial bill of material is kept in its original form so that you can call it again at any time.

To enable the free assignment of materials for maintenance task lists, your system administrator has to specify a BOM usage for maintenance-relevant BOMs (for example, usage 4 in the SAP standard system) in the **Customizing** settings for maintenance task lists.

Once the material has been freely assigned, do not make change the assigned usage. If you do make changes, existing free material assignments may be lost.

Further processing functions

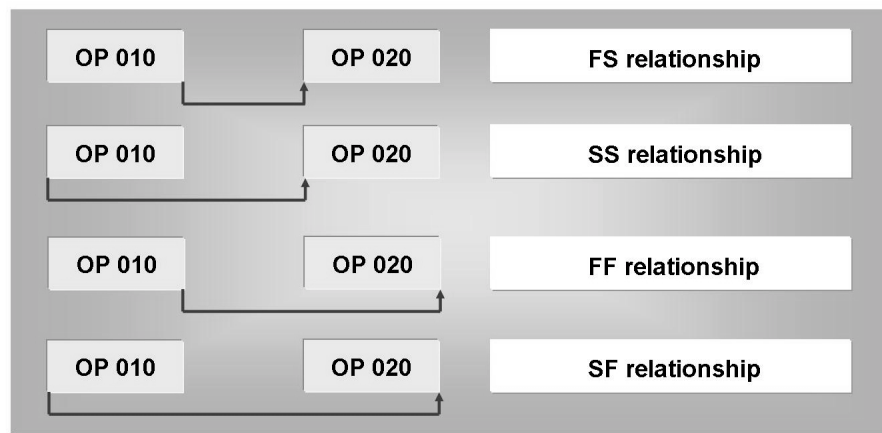


Figure 13: Relationships

The chronological order and time-based dependency of the individual operations is very important for efficient planning and implementation of comprehensive maintenance work. It is therefore important to set up a time-based relationship between the individual **operations** in a maintenance task list, in other words, link or network them to one another. For this, network technology and relationships are available in the PM system.

A **relationship** describes the logical and time-based dependency between two operations in a maintenance task list. The relationship indicates whether an operation precedes or follows another operation.

The type of relationship defines how the individual operations are linked with each other. There are four types of relationship:

- **FS relationship:** The end of one operation is linked to the start of the following operation.
- **SS relationship:** The start of one operation is linked to the start of the following operation.
- **FF relationship:** The end of one operation is linked to the end of the following operation.
- **SF relationship:** The start of one operation is linked to the end of the following operation.



Caution: The relationship view must be defined before a relationship is created. If this is not defined, problems can arise with the sequence of the operations.

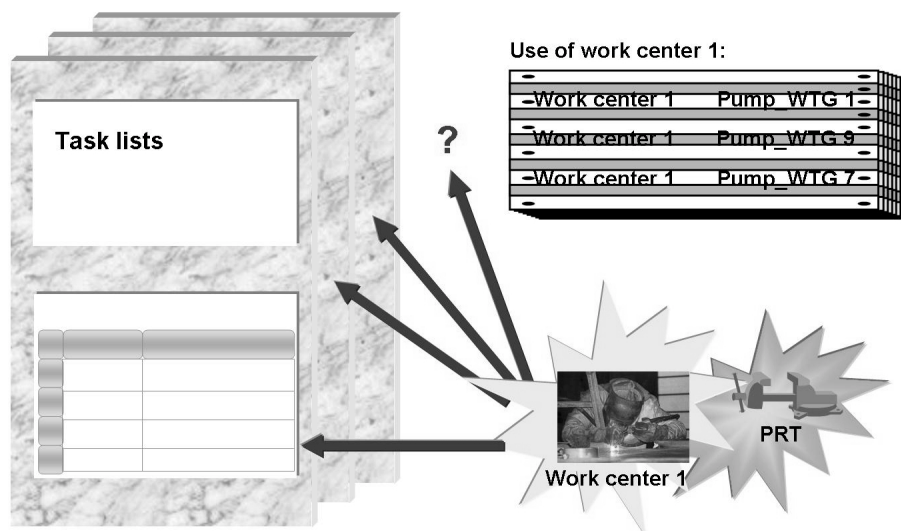


Figure 14: Where-used list for task lists and production resources/tools

It is often necessary to work out the usage of **work centers** or **production resources and tools (PRTs)** in different task lists to plan capacities efficiently.

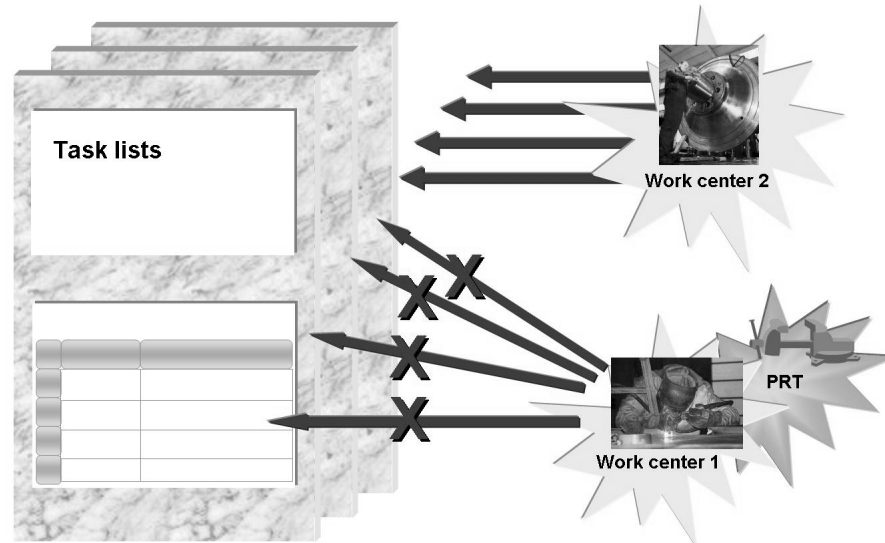


Figure 15: Exchanging work centers and production resources/tools

Existing assignments of **work centers** and **production resources** and tools to task lists can be changed.

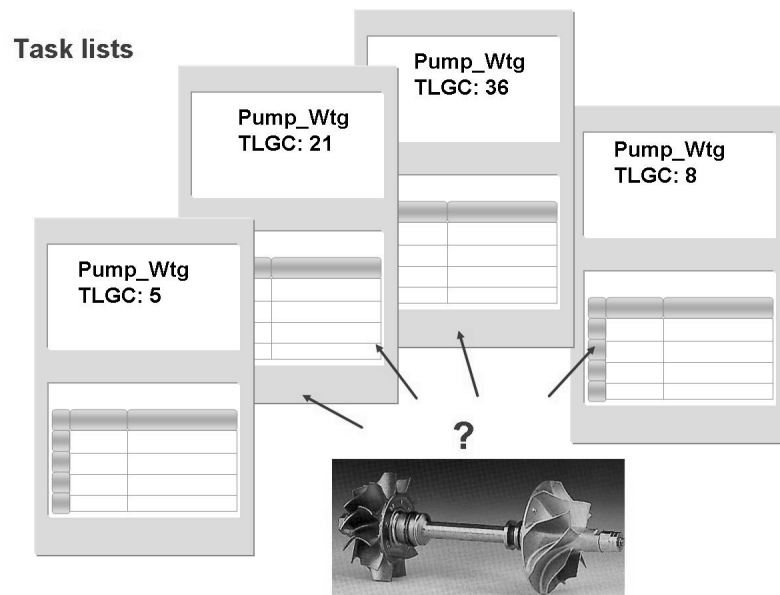


Figure 16: Material Where-Used List

You can check the use of materials in task lists using a where-used list.

This is particularly useful if the scheduled spare parts change and must be replaced.

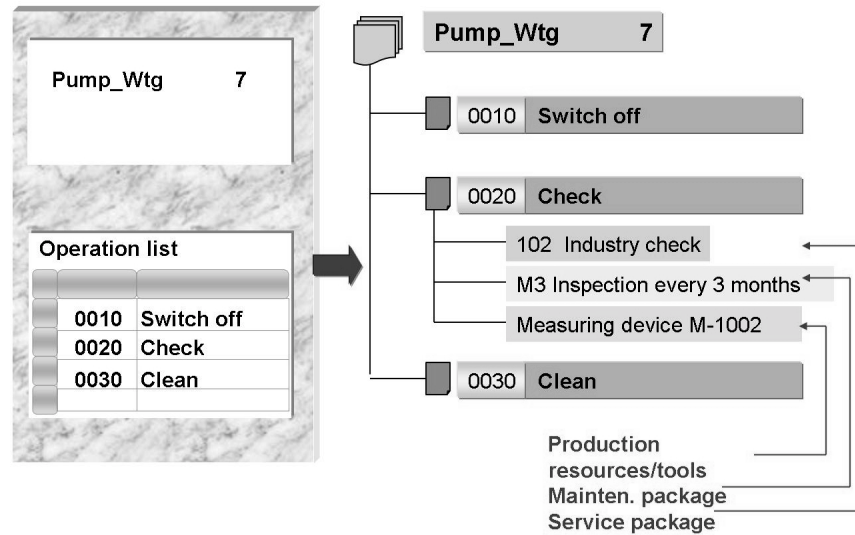


Figure 17: Object Overview

The different objects, which can be assigned to a task list, can be displayed within a total overview.

Objects that can be represented include:

- Materials
- Service packages
- Object dependency
- Maintenance packages
- Inspection characteristics and so on

You select objects in Customizing for the multi-level list display of task lists.

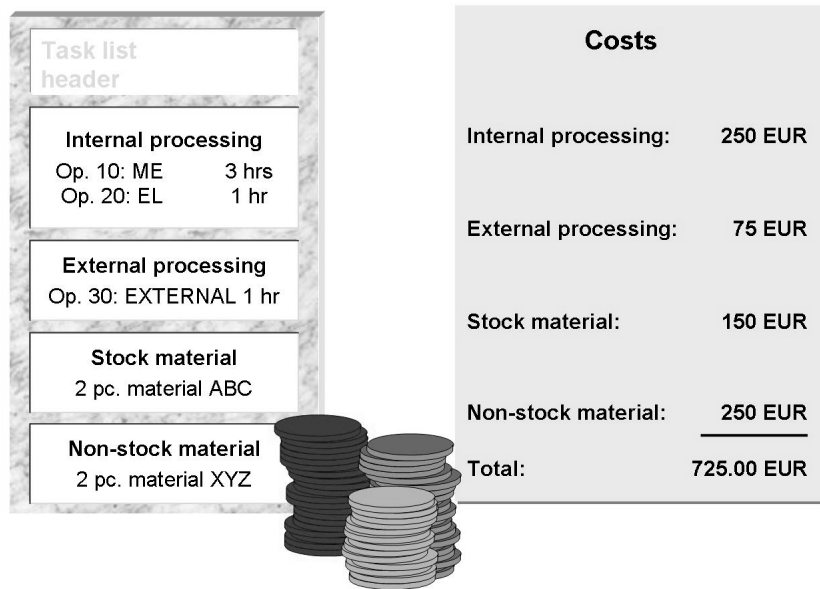


Figure 18: Cost analysis in the maintenance task list

You can only execute the cost analysis program for one task list type. This means, for example, that if you want to determine the costs for equipment task lists and for functional location task lists, you must run the program once for equipment task lists and once for functional location task lists.

You can either refer the cost analysis to complete maintenance task lists or single out individual operations (for example, all external processing operations).

The following data is entered in the cost analysis:

- All material costs
- All costs for external processing
- All costs for internal processing

In the cost analysis, you can request a log that checks all costing-related master for completeness and consistency. The system checks, for example, whether all activity types and valuation segments are maintained for the assigned materials. If errors occur, the relevant system messages are stored in the cost analysis log.

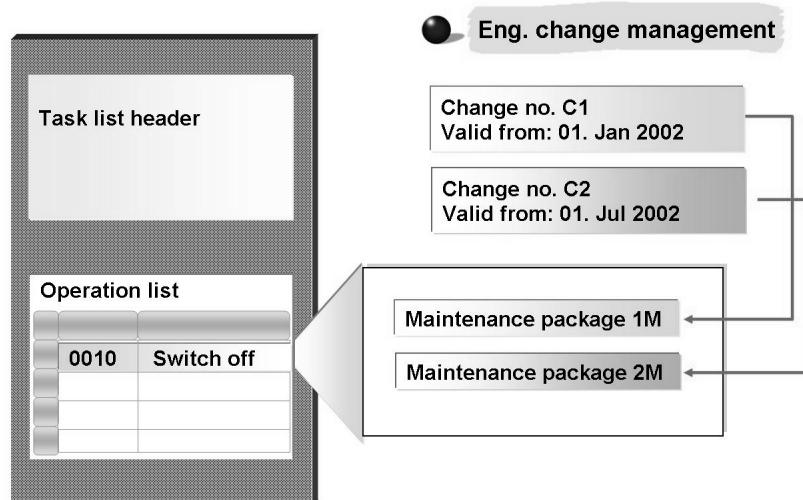


Figure 19: Engineering change management in the task list

Service and maintenance task lists can be used with engineering change management.

Different versions of a task lists can be saved with different change numbers. Change numbers are particularly useful if a certain combination of maintenance packages is only valid for a limited period.

In this case, the change number represents a version of a task list with a specific validity date.

If a task list with a change number is used in a maintenance plan, during maintenance plan scheduling the validity date of the change number is checked against the plan date. If a maintenance package is no longer valid (or not yet valid) with regard to a plan date, it is deactivated for this plan date.

Exercise 1: Task List Management

Exercise Objectives

After completing this exercise, you will be able to:

- Describe the concept of task lists
- Create object-based and object-independent task lists

Business Example

In the company, recurring work steps for standard preventive maintenance, inspection and repair work is to be displayed in task lists. A distinction is to be made between object-specific task lists and general task lists.

Task 1:

In plant **1000**, a new task list (type: general maintenance task list) should be created in the task list group **PM-##** using work center **T-ME##**. The task list will be used only in Plant Maintenance. Assign it the status *Released (general)*.

1. How are usage, status and increment controlled in the task list? How can these parameters be predefined for users? Make the necessary changes for your users.
2. How does the control key appear in the task list as a default value?
3. Create at least four operations specifying standard times, and using suitable standard text keys. Which operations have you created? Which control keys have been used?
4. The task list should be valid for the assembly **P-1000**. Enter the assembly in the correct place in the task list. Where do you enter this information?

Continued on next page

Task 2:

1. Assign the stock material 100-431 to one of the operations. How do you do this?

2. Assign 5 spacer rings from the structure list to one of the operations. How do you do this?

3. The second operation that you created is to start two hours after the first operation has been completed. The third and fourth operations are to start as soon as possible after the second operation has started. Include these restrictions in the task list. How do you do this?



Hint: If you cannot start the network graphic, check that the following information has been entered in the profile under **Extras** → **Settings** → **Profile**:

Group: PM

Name: Network

4. Draw up a cost estimate for the task list that you have just created. What are the resulting costs?
5. Copy the general task list you created earlier, and keep the same task list group. How do you do this?

Write down the task list group and group counter of the new general task list.

6. Generate a where-used list for the work center **MECHANIK**.

Use the following data:

Continued on next page

Work center:	MECHANIK
Plant:	1000
Task list type:	A
Task list status:	4
Task list usage:	4
Overview variant:	L000000000070

In which task lists is the work center used?

Solution 1: Task List Management

Task 1:

In plant **1000**, a new task list (type: general maintenance task list) should be created in the task list group **PM-##** using work center **T-ME##**. The task list will be used only in Plant Maintenance. Assign it the status *Released (general)*.

1. How are usage, status and increment controlled in the task list? How can these parameters be predefined for users? Make the necessary changes for your users.

- a) **SAP Menu** → **Logistics** → **Plant Maintenance** → **Preventive Maintenance** → **Work Scheduling** → **Task Lists** → **General Maintenance Task Lists** → **Create**

Usage, status and increment are defined using the profile. You can enter the profile in the user parameters using the parameter ID PIN:

System → **User Profile** → **Own Data**, tab *Parameters*

Field Name or Data Type	Values
<i>Parameter ID</i>	PIN
<i>Parameter value</i>	0000001

2. How does the control key appear in the task list as a default value?
 - a) The control key is copied from the work center (Default Values screen in the work center master record).
3. Create at least four operations specifying standard times, and using suitable standard text keys. Which operations have you created? Which control keys have been used?
 - a) Use the *Std txt* field to create the operations in the operation overview. Use the possible entries help (F4) in the Std txt field and select a suitable text key. The text module is only displayed once you have entered the data.
4. The task list should be valid for the assembly **P-1000**. Enter the assembly in the correct place in the task list. Where do you enter this information?
 - a) Task list header, field *Assembly*, entry: **P-1000**.

Continued on next page

Task 2:

1. Assign the stock material 100-431 to one of the operations. How do you do this?

Answer: Select the operation. Choose *Components*, enter the material number and quantity. Select the item category **L** for stock item.

2. Assign 5 spacer rings from the structure list to one of the operations. How do you do this?

Answer: Select the operation; *Components*, *Component selection* and then *Expand whole*. Select a material

3. The second operation that you created is to start two hours after the first operation has been completed. The third and fourth operations are to start as soon as possible after the second operation has started. Include these restrictions in the task list. How do you do this?



Hint: If you cannot start the network graphic, check that the following information has been entered in the profile under **Extras** → **Settings** → **Profile**:

Group: PM

Name: Network

- a) In task list **Goto** → **Network graphic**

Choose *Link*, connect the end of operation 1 with the start of operation 2. Double-click the link displayed. Enter two hours in the *Relationship time interval* field. Connect the start of operation 2 with the start of operation 3. Connect the start of operation 2 with the start of operation 4.

4. Draw up a cost estimate for the task list that you have just created. What are the resulting costs?

- a) **SAP Menu** → **Logistics** → **Plant Maintenance** → **Preventive Maintenance** → **Work Scheduling** → **Evaluations** → **Task List Costing**

5. Copy the general task list you created earlier, and keep the same task list group. How do you do this?

Continued on next page

Write down the task list group and group counter of the new general task list.

- a) *SAP Menu → Logistics → Plant Maintenance → Preventive Maintenance → Work Scheduling → Task Lists → General Maintenance Task Lists → Create*

General Task List → Copy Reference (Copy reference icon)

Select general maintenance task list, enter task list group > New general task list is created > Maintain *Task list status* field > Value: **4**; then *Copy* pushbutton

6. Generate a where-used list for the work center **MECHANIK**.

Use the following data:

Work center:	MECHANIK
Plant:	1000
Task list type:	A
Task list status:	4
Task list usage:	4
Overview variant:	L000000000070

In which task lists is the work center used?

- a) *SAP Menu → Logistics → Plant Maintenance → Preventive Maintenance → Work Scheduling → Evaluations → Usages → Work Center Usage*

Enter the plant, work center and type. Select Execute. Enter the overview variant.

Task lists:

For example, General, external, Pump_Mnt, Pump_Rep, Pump_Wtg, Valv_Wtg



Lesson Summary

You should now be able to:

- Create task lists
- Assign material, PRTs and so on, to operations
- Manage where-used lists
- Make mass changes
- Analyze costs

Lesson: Task List and Order

Lesson Overview

This lesson shows how the task list and order interact.



Lesson Objectives

After completing this lesson, you will be able to:

- Copy task lists into orders

Business Example

It should be possible to use task lists for breakdown and corrective maintenance in the company.

Task List and Order

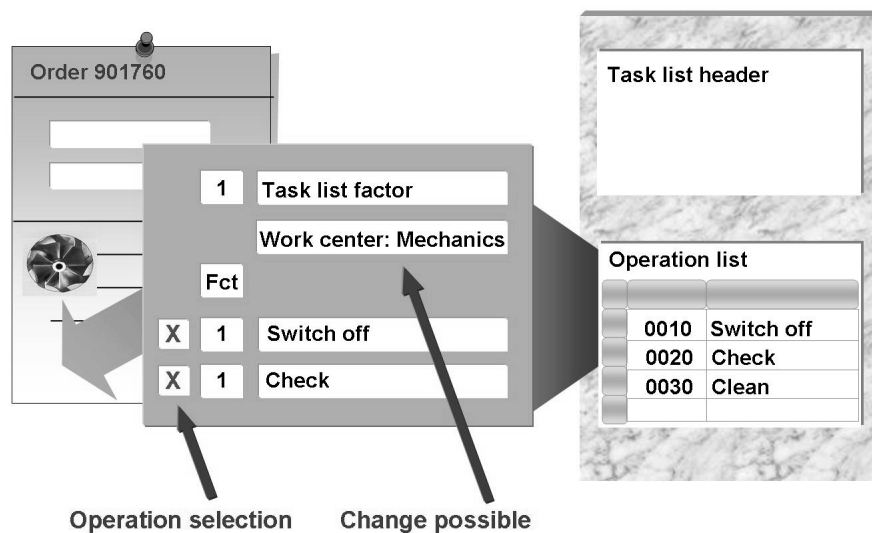


Figure 20: Task List Transfer

To facilitate creating orders for preventive maintenance, existing task lists can be integrated directly into orders.

You can make settings in Customizing so that a **dialog box** appears when you include a task list in an order. This dialog box enables you to **choose operations**, **change the work center** and **set execution factors**.

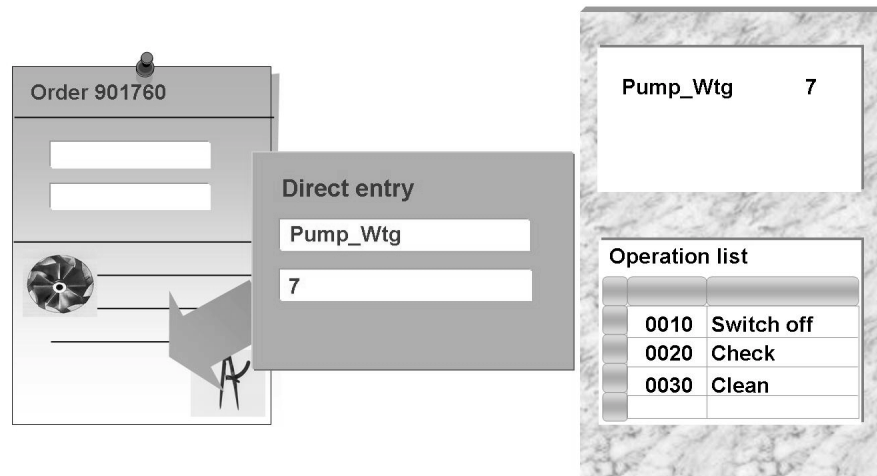


Figure 21: Selection Procedure for Task Lists I

Within an order, task lists can be selected in different ways. If the task list group and task list group counter are known, the task list can be selected by **direct entry**.



Selection of general task lists:

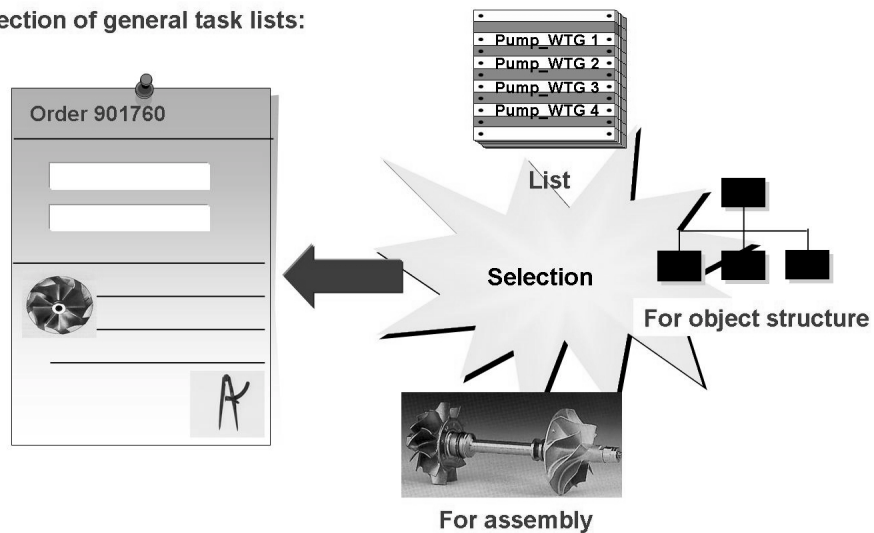


Figure 22: Selection Procedure for Task Lists II

Further selection procedures for task lists:

- **General Task Lists:** You can use a list to display a selection of general maintenance task lists. The selection criteria of task list type (A), plant and status (released for order) are preset. You can add further criteria.
- **For object structure:** All the task lists, which have been created for the objects that are sub-objects of the reference object, are selected here.
- **For assembly:** All the task lists, which have been created for the object that was entered in the *Assembly* field in the order header, are selected here.

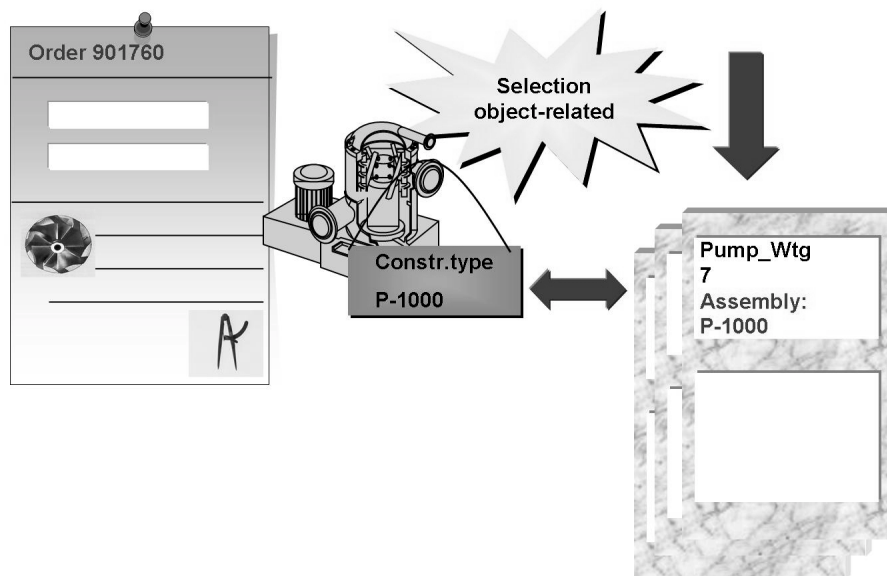


Figure 23: Selection Procedure for Task Lists III

The **object-related** selection procedure enables you to select task lists based on the reference object.

If a piece of equipment with **construction type** is specified as the reference object, all equipment task lists for the equipment concerned are supplied, as are all general task lists, for which the **assembly** in the task list header corresponds to the construction type for the equipment.

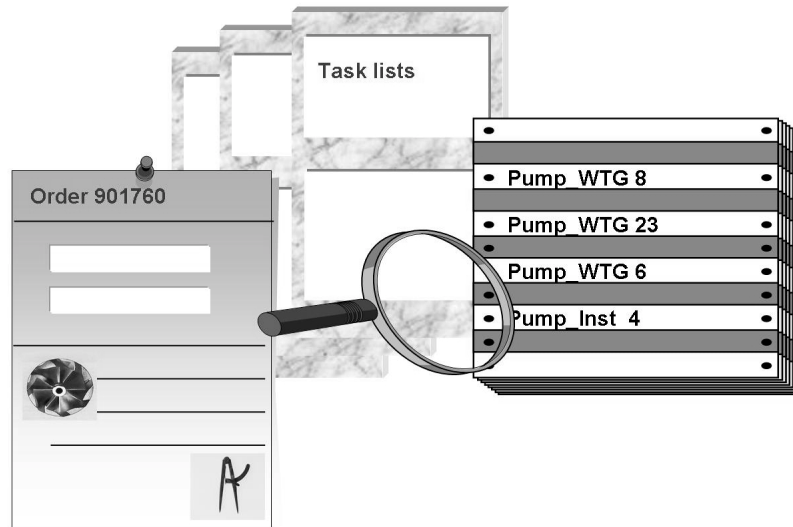


Figure 24: Overview of Included Task Lists

If operations from several different task lists are used in an order, a list of all the task lists used can be displayed.

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Exercise 2: Task List and Order

Exercise Objectives

After completing this exercise, you will be able to:

- Include a task list in an order

Business Example

In the company, task lists are also to be used for breakdown-based orders.

Task:

1. Create a new order for the piece of equipment **TEQ-##** and incorporate the task list that you have just created, taking the following points into consideration:
2. Which selection methods are available?
Which is the most suitable method in this case?
3. In this case, the work is to be performed by the **MECHANIK** work center and not the **T-ME##** work center. Change the work center when you incorporate the task list.
How do you do this?
Which order number does the system assign?

Solution 2: Task List and Order

Task:

1. Create a new order for the piece of equipment **TEQ-##** and incorporate the task list that you have just created, taking the following points into consideration:
 - a) *SAP Menu → Logistics → Plant Maintenance → Maintenance Processing → Order → Create (General)*
2. Which selection methods are available?
Which is the most suitable method in this case?
 - a) Selection methods:
Direct entry, object-related, general task lists for assembly, general task lists for object structure, general task lists
 - b) Most suitable method:
Extras → Task list selection → Object-related
(Since all the task lists with the entry **P-1000** in the task list header are selected – compare also the entry in the field *Construction type* in the maintenance data for the equipment).
3. In this case, the work is to be performed by the **MECHANIK** work center and not the **T-ME##** work center. Change the work center when you incorporate the task list.
How do you do this?
Which order number does the system assign?
 - a) Change the work center in the task list selection window.



Lesson Summary

You should now be able to:

- Copy task lists into orders

Lesson: Configurable Task Lists

Lesson Overview

This lesson shows the configuration of task lists.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the functions of configurable general maintenance task lists

Business Example

In the company, an maximum task list is to be available for different variants of a technical object. The operations of this general task list can be selected to match the characteristics of the object.

Configurable Task Lists

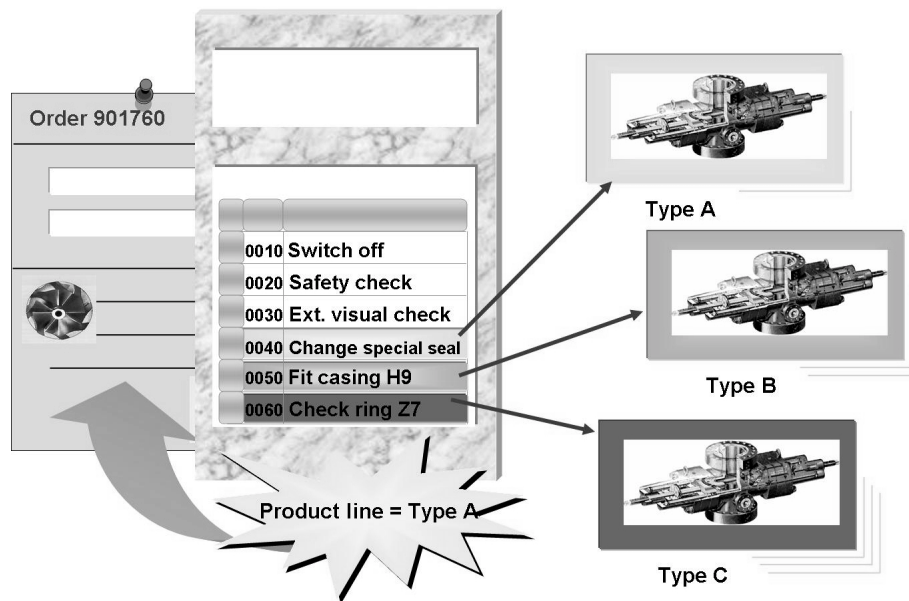


Figure 25: What are Configurable Task Lists?

Configurable task lists enable you to group operations for objects that are only slightly different. You therefore only need to create one single task list for different variants of an object.

When a configurable task list is included in an order, operations are selected on the basis of characteristics. Operations use **object dependencies** - a combination of characteristics and values. When a task list is selected, the characteristic value is requested.

For example: Three different types of electric pump (types A, B and C) are used in a clarification plant. There is only a slight difference in the structure of these pumps and how they are maintained. The aim is to combine the work required for all three types of pump into a single general task list.

The operations to be executed separately for each type are assigned a label (= object dependency) to indicate the type for which the operations are to be performed (for example, only change special seal XZ-100 for type A, since only type A uses this seal).

Labels are not assigned to operations performed in the same way for all pumps (for example, switching off, safety check, external visual check), and these operations are therefore activated for each type.

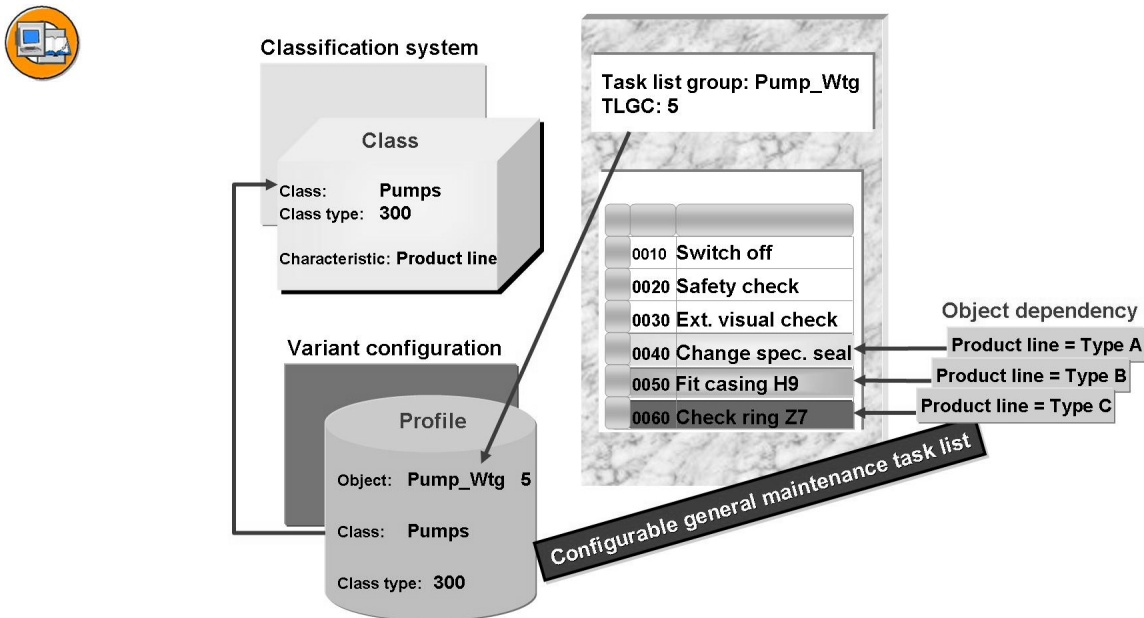


Figure 26: Functions I

The prerequisites for creating configurable task lists (general maintenance task lists) are:

A **class** must be created for the relevant objects in the classification system. SAP recommends creating this class for **class type 300**, since this is defined as a variant class type in the standard system.

The **characteristics** that help differentiate between objects are assigned to the class.

A **configuration profile** is created in **variant configuration**. This profile links the general maintenance task list (task list group and task list group counter), the class and class type.

Object dependencies are assigned to the operations in the general task list, which should be made configurable (example: line of products = type A).

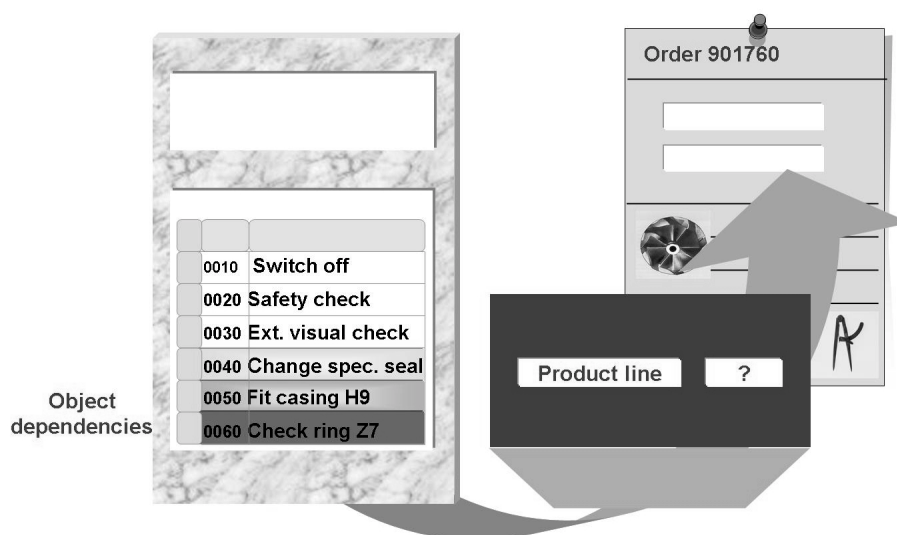


Figure 27: Functions II

When the configurable general task list is included in an order, the characteristic value is requested.

Depending on the features of the characteristic, you can enter the available values manually or display and select them from the possible entries help (F4).

When a value is entered, the operations that have this value for the characteristic in their object dependency are selected from the task list.

The operations that have no object dependencies, that is, that are the same for all objects, are copied automatically.

Exercise 3: Configurable Task Lists

Exercise Objectives

After completing this exercise, you will be able to:

- Describe a configurable task list

Business Example

In the company, the work for objects with many variants is to be mapped using a super task list.

Task 1:

1. Maintenance tasks are to be performed for a pump with a **steel casing**. Create a new order and incorporate the configurable general task list **PUMP_WTG 6**, group counter **6** accordingly.

Use the following data:

Order type	PM01
Equipment:	TEQ-##
Task list group (task list)	PUMP_WTG
Task list group counter:	6

How do you proceed?

Task 2:

Optional:

Make the necessary additions so that the task list you created becomes a configurable task list.

1. Create a configuration profile for the task list.

Use the following data:

Class:	PUMPS
Class type:	300

Continued on next page

How do you do this?

Why must the configuration profile be created?

Which profile have you created?

2. Assign object dependencies to one or more operations in the task list.

Use the following data:

Characteristic:	Pump capacity (FL)
Characteristic values:	10 m³/s, 20 m³/s, 30 m³/s

How do you proceed?

3. Create a new order and check whether the object dependencies that you created influence the operation selection correctly.

How do you include the task list in the order?

Which characteristic valuation have you made?

Solution 3: Configurable Task Lists

Task 1:

- Maintenance tasks are to be performed for a pump with a **steel casing**. Create a new order and incorporate the configurable general task list **PUMP_WTG 6**, group counter **6** accordingly.

Use the following data:

Order type	PM01
Equipment:	TEQ-##
Task list group (task list)	PUMP_WTG
Task list group counter:	6

How do you proceed?

- SAP Menu* → *Logistics* → *Plant Maintenance* → *Maintenance Processing* → *Order* → *Create (General)*

Field name or data type	Values
<i>Task list group</i>	PUMP_WTG
<i>Task list group counter</i>	6
<i>Internal characteristic - casing</i>	S (steel)

Task 2:

Optional:

Make the necessary additions so that the task list you created becomes a configurable task list.

- Create a configuration profile for the task list.

Use the following data:

Class:	PUMPS
Class type:	300

Continued on next page

How do you do this?

Why must the configuration profile be created?

Which profile have you created?

- a) **SAP menu** → **Logistics** → **Plant Maintenance** → **Preventive Maintenance** → **Maintenance Planning** → **Work Scheduling** → **General Maintenance Task Lists** → **Configuration Profile** → **Create**

Select the general maintenance task list.

Field name or data type	Values
<i>Enter task list group</i>	PM-##
<i>Enter task list group counter</i>	1
<i>Enter profile names</i>	Use any name
<i>Class type</i>	300
<i>Status</i>	1 (released)
<i>Class assignment</i>	PUMPEN

The configuration profile links the class and the general maintenance task list. The characteristics at operation level are only recognized once assignments have been made in the configuration profile.

2. Assign object dependencies to one or more operations in the task list.

Use the following data:

Characteristic:	Pump capacity (FL)
Characteristic values:	10 m³/s, 20 m³/s, 30 m³/s

Continued on next page

How do you proceed?

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Work Scheduling → General Maintenance Task Lists → Change*

Select operation; *Extras → Object Dependencies → Editor;*

Field name or data type	Values
<i>Relationship type</i>	Selection condition
<i>Enter object dependencies</i>	For example, FL = 10

3. Create a new order and check whether the object dependencies that you created influence the operation selection correctly.

How do you include the task list in the order?

Which characteristic valuation have you made?

- a) *SAP Menu → Logistics → Plant Maintenance → Maintenance Processing → Order → Create (General)*

Extras → Task list selection → To reference object

⇒ Enter the task list group and group counter of the configurable task list

After you select the task list, the “Characteristic Valuation” screen is displayed.

The value of the characteristic (for example, 10, 20 or 30) is entered here.

Select F3 to go back.

The operations, whose object dependencies contain this value, are included in the order. The system also incorporates all operations without object dependencies.



Lesson Summary

You should now be able to:

- Describe the functions of configurable general maintenance task lists

Lesson: Task List Customizing

Lesson Overview

This lesson shows the Customizing settings for task lists.



Lesson Objectives

After completing this lesson, you will be able to:

- Make the most important Customizing settings for task lists

Business Example

In the company, the use of task lists should be configured as effectively.

Configuration of the notification interface

Profile

The profile can be used to make settings for creating task lists, such as step-by-step progress of operations, calculation key, unit of duration, unit of work and so on.

User fields

The user fields can be used to define fields for texts, information about quantities, values, dates, deadlines, indicators and so on. Selection is made using a field key.

Control key

The control key defines the following parameters for the operations in the task list:

Scheduling, determining capacity requirements, costs activity, costing, printing time ticket, printing completion confirmation, printing, completion confirmation, external processing, service, text (calling up long text, long text available).

Presetting for free material assignment

You can use free material assignment at any time to assign materials, general maintenance task lists, equipment task lists or general task lists to functional locations, without the material being a component in the object BOM (for example, equipment BOM). For these “free” materials - not assigned to the object BOM, the system generates a bill of material in the background. This bill of material cannot be maintained using application transactions.



Lesson Summary

You should now be able to:

- Make the most important Customizing settings for task lists



Unit Summary

You should now be able to:

- Create task lists
- Assign material, PRTs and so on, to operations
- Manage where-used lists
- Make mass changes
- Analyze costs
- Copy task lists into orders
- Describe the functions of configurable general maintenance task lists
- Make the most important Customizing settings for task lists

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Unit 3

Single Cycle Maintenance Planning

Unit Overview

This unit follows on from the unit *Preventive Maintenance* in course PLM300, and recaps terminology and concepts relating to maintenance planning.



Unit Objectives

After completing this unit, you will be able to:

- Describe the different areas of maintenance planning
- Create a single cycle plan with the Order call object
- Schedule a single cycle plan
- Configure the scheduling parameters
- Schedule a single cycle plan
- Create and schedule a single cycle plan with the Notification call object
- Create and schedule a single cycle plan with the Service Entry Sheet call object
- Make the settings for maintenance plans

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Lesson: General information about maintenance plans

Lesson Overview

This lesson demonstrates the different areas of maintenance planning.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the different areas of maintenance planning

Business Example

In the company, it is first necessary to check which machines and plants need to be checked on a time or performance basis.

General information about maintenance plans

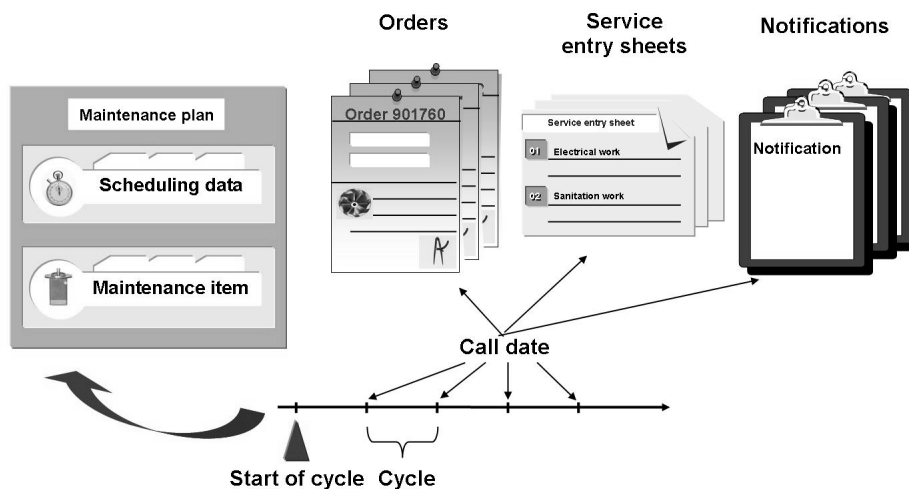


Figure 28: Functionality of the maintenance plan

A maintenance plan is used to generate a **call object** automatically for a particular date.

A call object can be a maintenance order, maintenance notification or service entry sheet.

The order and notification can also be generated at the same time.

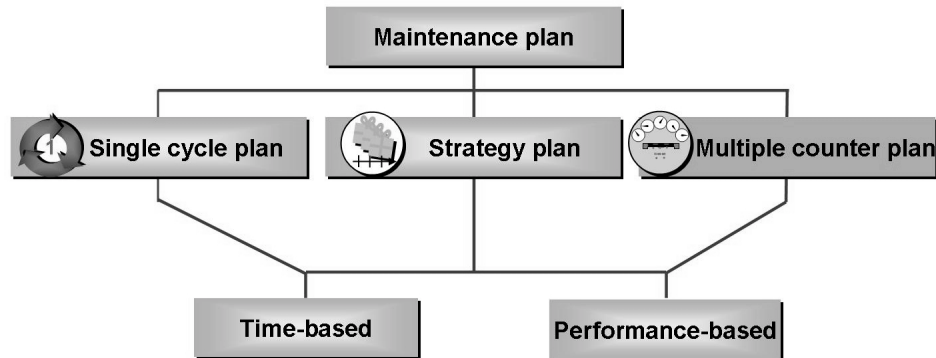


Figure 29: Maintenance Plans Overview

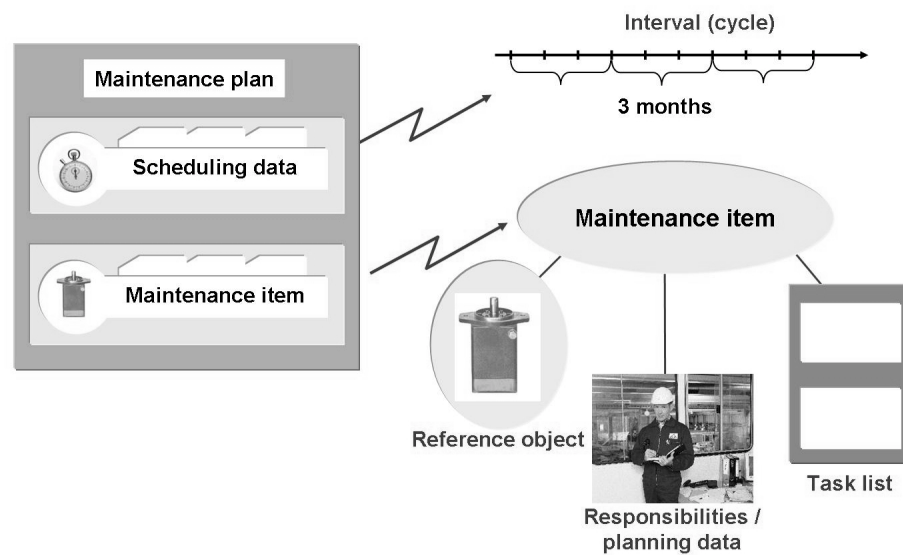


Figure 30: Structure of Maintenance Plan

The maintenance item contains the following data areas:

- **Planning data:**
Maintenance planning plant, maintenance planner group, order type, maintenance activity type, main work center, business area
- **Reference object**
- **Task List**

The maintenance interval (cycle) is assigned at the level of the maintenance plan:

- **Interval**

Cycle, offset, cycle text

A maintenance plan can consist of several maintenance items. In this case, an order (or notification or service entry sheet) is created for each maintenance item.

For example:

In a maintenance plan, different components of a water pump should be maintained. For example, you could create a maintenance item for the pump itself, another item for the electric motor, and a third for the pump gears. Each maintenance item has its own task list. All the items are part of the same maintenance plan and thereby have the same times (that is, the same scheduling data).

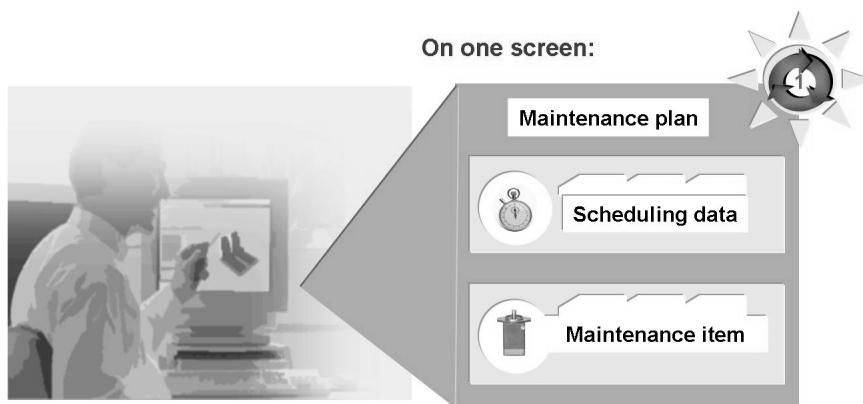


Figure 31: Single Cycle Plan

A maintenance plan can be entered on one screen that contains all the relevant data:

- Cycle
- Object
- Planning data
- Task List



Lesson Summary

You should now be able to:

- Describe the different areas of maintenance planning

Lesson: Calling Orders

Lesson Overview

This lesson shows how maintenance orders can be called automatically from a maintenance plan.



Lesson Objectives

After completing this lesson, you will be able to:

- Create a single cycle plan with the Order call object
- Schedule a single cycle plan

Business Example

Some objects are maintained in a fixed cycled determined by a standard. This is to be covered using single cycle maintenance plans.

Calling Orders

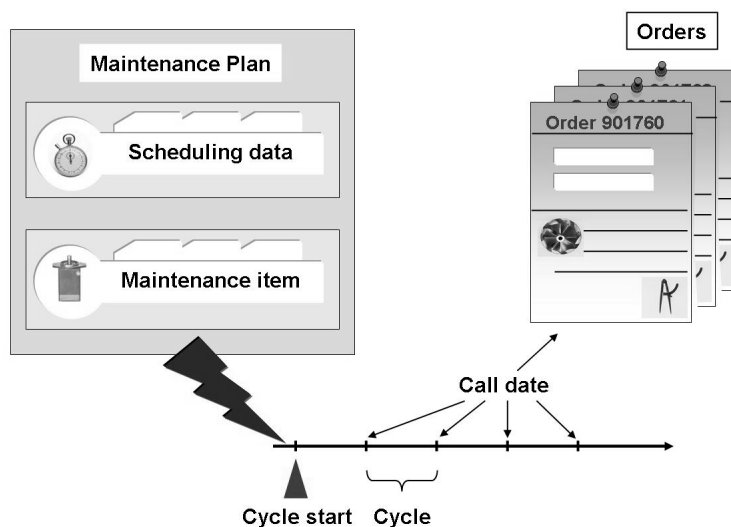


Figure 32: Calling up orders

Maintenance plans can generate maintenance orders automatically.

The *Order call object* is selected when the maintenance plan is created using the **category** of maintenance plan.

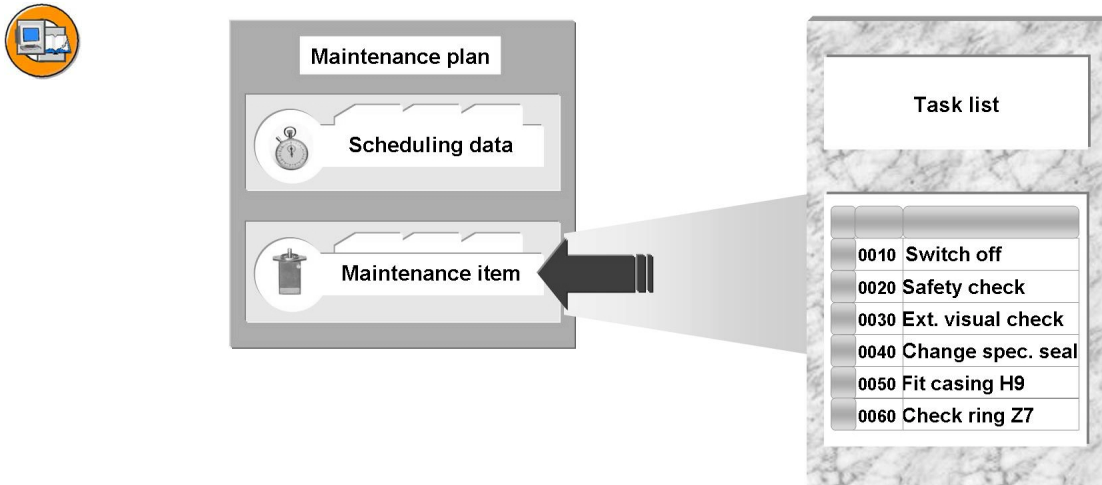


Figure 33: Maintenance Plan with Task List

You can assign a task list in the maintenance item. This task list defines the operations to be executed for the objects specified in the maintenance item.

You also have the option of creating new maintenance task lists from the maintenance plan (general maintenance task lists, equipment task lists, and functional location task lists).

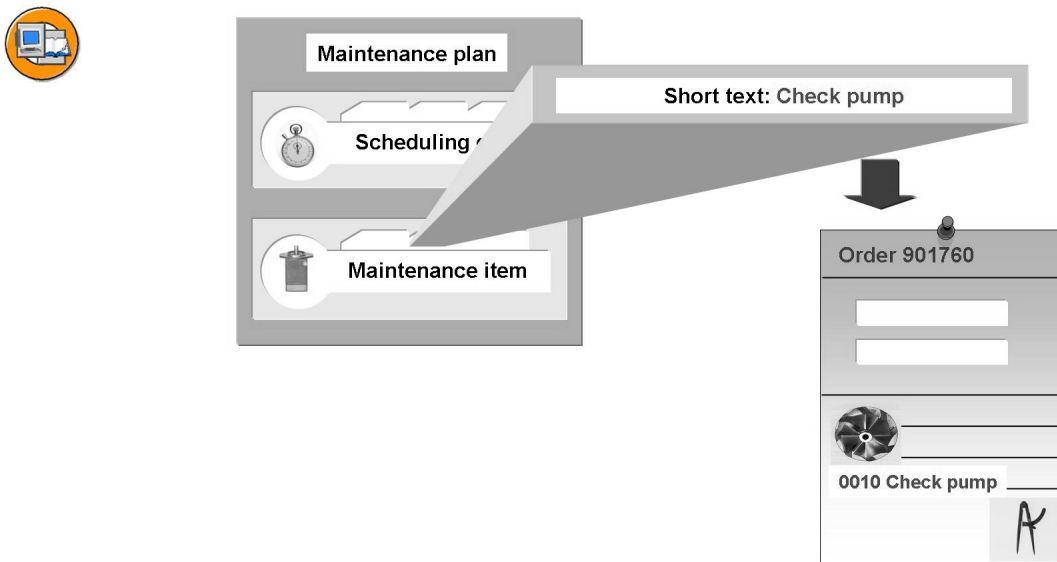


Figure 34: Maintenance Plan Without Task List

If no task list has been entered in the maintenance item for the maintenance plan, the system copies the short text for the maintenance plan into the maintenance order as an operation description.

In this way, short orders can be generated without a task list.

The planner can add additional operations to the maintenance order, if required.

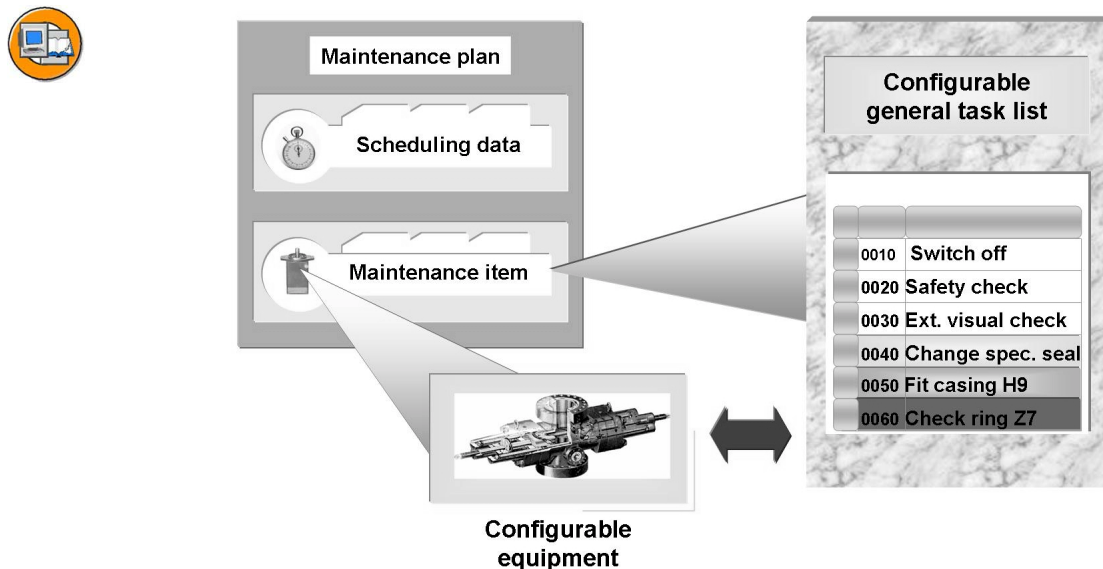


Figure 35: Including Configurable General Task Lists

You can also include **configurable general maintenance task lists** in the maintenance plan.

A prerequisite for this is a **configurable piece of equipment** as reference object in the maintenance item.

The configuration profiles of the general maintenance task list and equipment must refer here to the same class.

The object dependencies to the items in the equipment BOM and the operations in the general maintenance task list must use the same characteristics.

In the piece of equipment, a value is assigned to the characteristic (for example, category of water pump = A) in the *Configuration* view. This valuation is then used to select from the general maintenance task list the operations that have the same object dependencies (category of water pump = A).

Exercise 4: Calling Orders

Exercise Objectives

After completing this exercise, you will be able to:

- Describe the structure of a single-cycle maintenance plan
- Create a single cycle maintenance plan

Business Example

In the company, all maintenance work and inspections to be performed at fixed intervals for the foreseeable future are to be controlled using single cycle maintenance plans. All routine maintenance work is to be covered by maintenance orders that are generated automatically.

Task 1:

The pumps for biological cleaning at clarification plant ## are to be maintained at regular intervals.

1. Create a single cycle plan with a 3-monthly interval for the pump **TEQ-##**. Use the general maintenance task list **PUMP_WTG** (group counter: 1) to enter the steps.

How do you do this?

What prompt appears when you save the single cycle plan?

What maintenance plan number does the system assign?

2. Create a second maintenance item for the motor in the pump **TEQ-##**.

How do you select the motor?

Which general maintenance task list do you choose?

Continued on next page

Task 2:

1. All pumps for biological cleaning at clarification plant **K1** should be maintained at 3-monthly intervals.

Create a new single cycle plan with an object list and suitable task list for the biological cleaning pumps.

Which reference object do you choose for the maintenance item?

How do you select the pumps?

Enter a suitable task list

What maintenance plan number does the system assign?

Task 3:

Use the object list sort function to define the sequence in which work is to be carried out on the pumps (inspection round planning).

The inspection round is to be performed in the following order:

1. stop	P-1000-N001
2. stop	P-1000-N006
3. stop	P-1000-N005
4. stop	P-1000-N003
5. stop	P-1000-N004
6. stop	P-1000-N002
7. stop	P-1000-N007
8. stop	...

1. Which steps do you have to carry out?

Make sure that all the operations for your task list in the most recent maintenance order have been performed according to the number of pieces of equipment incorporated. How can you do this?

Continued on next page

Task 4:

1. For the above maintenance plan, define the same parameters as in the maintenance plan created earlier and start the plan. How do you do this?

What options do you have for starting the maintenance plan?

Display the maintenance order and check the object and operation lists for the order.

Task 5:

Create a maintenance plan to control the biological cleaning valves in the pump station (in **clarification plant ##**) that are represented as functional locations. Cleaning is to be carried out every six months. This plan is to generate “short orders” (that is, orders that do not use a task list).

1. How do you enter the work to be carried out?

Which reference object do you choose?

How do you make reference to the valves in the maintenance plan? Which valves are affected?

Enter today's date as the cycle start and calculate planned dates for two years. How do you do this?

What maintenance plan number does the system assign?

Start the maintenance plan and check the calls. How do you do this?

Solution 4: Calling Orders

Task 1:

The pumps for biological cleaning at clarification plant ## are to be maintained at regular intervals.

1. Create a single cycle plan with a 3-monthly interval for the pump **TEQ-##**. Use the general maintenance task list **PUMP_WTG** (group counter: **1**) to enter the steps.

How do you do this?

What prompt appears when you save the single cycle plan?

What maintenance plan number does the system assign?

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan*

Leave the maintenance plan number field blank (this entry is assigned internally, but can also be assigned externally).

Maintenance plan category: **PM (Maintenance order)**

Field name or data type	Values
Cycle	3 months
Reference object (equipment)	TEQ-##
Task list - Type	A
TaskLstGrp	PUMP_WTG
Task list - GrpCr	1

Planning data: This is read from the equipment.

Exception: Order type and maintenance activity type, which are set in Customizing as default values for the maintenance item.

Prompt when saving: Question about the cycle start date; Default value: Today's date

Continued on next page

2. Create a second maintenance item for the motor in the pump TEQ-##.

How do you select the motor?

Which general maintenance task list do you choose?

-
- a) **SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Change**

In the area of the maintenance item, tab page *Item*.

Select *Create More Items* (white sheet of paper icon)

Enter equipment TEQ-## as the reference object

Extras → Structure list

⇒ Select the motor assembly M-1000 from the bill of material for the equipment TEQ-##

General maintenance task list:

Select *Task List* (binoculars icon)

Activate the *General task list* checkbox, and enter “motor” in the *Short text* field

⇒ For example, general task list PUMP_WTG 2

Task 2:

1. All pumps for biological cleaning at clarification plant **K1** should be maintained at 3-monthly intervals.

Create a new single cycle plan with an object list and suitable task list for the biological cleaning pumps.

Which reference object do you choose for the maintenance item?

How do you select the pumps?

Enter a suitable task list

What maintenance plan number does the system assign?

Continued on next page

- a) *SAP menu* → *Logistics* → *Plant Maintenance* → *Preventive Maintenance* → *Maintenance Planning* → *Maintenance Plans* → *Create* → *Single Cycle Plan*

Field name or data type	Values
Maintenance plan category	Maintenance order
Cycle/Unit	3 MON
Reference objects	K1-B (functional location)
Task list	For example, A PUMP_WTG 1

To create the object list: On the *Object list item tab*, choose *Equipment selection*.

Selection criteria:

Functional location: **K1-B***

Description of object: Button *Selection Equipment*

⇒ Single value (green): “*pump*”

⇒ Single value (red): “*mot*” (⇒ All motors are excluded)

Make a selection, button *Select all*, and button *Choose*.

⇒ All pumps for biological cleaning are copied into the object list.

Continued on next page

Task 3:

Use the object list sort function to define the sequence in which work is to be carried out on the pumps (inspection round planning).

The inspection round is to be performed in the following order:

1. stop	P-1000-N001
2. stop	P-1000-N006
3. stop	P-1000-N005
4. stop	P-1000-N003
5. stop	P-1000-N004
6. stop	P-1000-N002
7. stop	P-1000-N007
8. stop	...

1. Which steps do you have to carry out?

Make sure that all the operations for your task list in the most recent maintenance order have been performed according to the number of pieces of equipment incorporated. How can you do this?

- a) Inspection round planning using sort field:

For example, enter the numerical keys 0001 to 00XX in the appropriate sequence in the *Sort* column of the object list, and choose *Sort*.

Task 4:

1. For the above maintenance plan, define the same parameters as in the maintenance plan created earlier and start the plan. How do you do this?

What options do you have for starting the maintenance plan?

Display the maintenance order and check the object and operation lists for the order.

Continued on next page

-
- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan*

Maintenance plan scheduling parameters tab

First option (individual):

SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule

Edit → Start

Second option (multiple):

SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Deadline Monitoring

Task 5:

Create a maintenance plan to control the biological cleaning valves in the pump station (in **clarification plant ##**) that are represented as functional locations. Cleaning is to be carried out every six months. This plan is to generate “short orders” (that is, orders that do not use a task list).

1. How do you enter the work to be carried out?

Which reference object do you choose?

How do you make reference to the valves in the maintenance plan? Which valves are affected?

Enter today's date as the cycle start and calculate planned dates for two years. How do you do this?

What maintenance plan number does the system assign?

Start the maintenance plan and check the calls. How do you do this?

Continued on next page

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan*

Leave the maintenance plan number field blank (this entry is assigned internally, but can also be assigned externally).

Maintenance plan category: **PM (Maintenance order)**

Field name or data type	Values
Work to be performed	Description of maintenance item - Copied as default operation for the order
Reference objects	##-B01
Specification of the valves	<i>Object list item tab</i> Functional location: ##-B01*
Selection criteria	FuncnLocation description: Vent*
Start of cycle	Today's date
Scheduling period	2 YR

SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule

Edit → Start

Save. Open the maintenance plan again (scheduling mode), select the first line (if this contains a call) and select *Display call object* (glasses icon).



Lesson Summary

You should now be able to:

- Create a single cycle plan with the Order call object
- Schedule a single cycle plan

Lesson: Single Cycle Plan Scheduling

Lesson Overview

This lesson shows the basic procedure for scheduling and the scheduling parameters that are used.



Lesson Objectives

After completing this lesson, you will be able to:

- Configure the scheduling parameters
- Schedule a single cycle plan

Business Example

Scheduling of the active maintenance plans in the company should be set up in such a way that groups of maintenance plans can be created and scheduled in the night between 1 a.m. and 2 a.m.

Scheduling

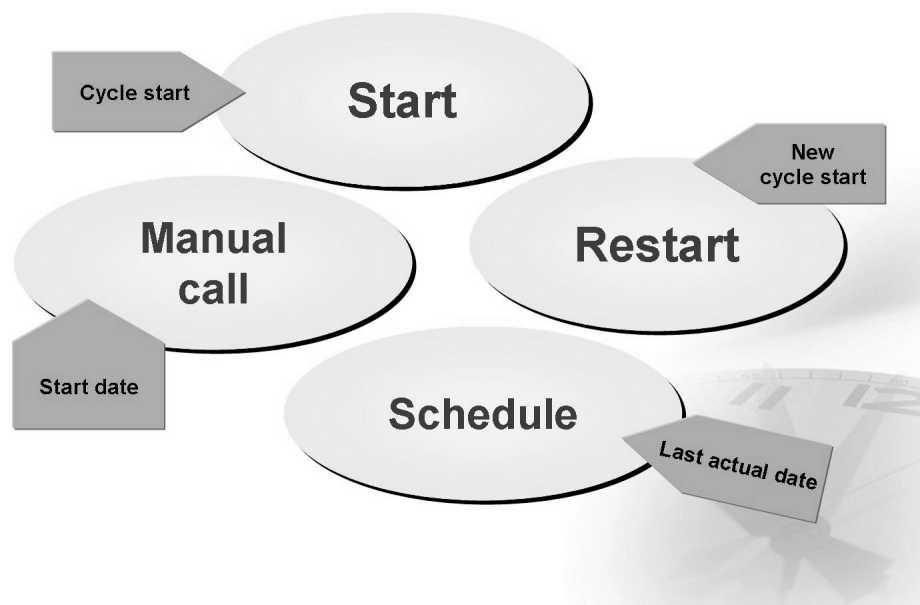


Figure 36: Scheduling Functions - Single Cycle Plan

Start: The maintenance plan is started for the first time. If a start date has already been entered in the scheduling parameters, this is proposed. If no start date has been specified, you must now enter this information.

Restart: If you accidentally set the wrong start date at the beginning, or if the framework conditions have changed, the maintenance plan can be restarted. All existing waiting planned dates can be deleted. This does not affect calls that have already been carried out

Schedule: Calculates new planned dates, call dates, and (if applicable) calls the next maintenance order. Scheduling can be executed manually, but is usually performed as deadline monitoring automatically for several maintenance plans using a system job.

Manual call: If you also want to schedule a maintenance plan call for a particular date, you can schedule this manually. You can use a manual call to insert additional dates without impacting on normal scheduling. To do this, you specify a new call date.

You can use the **Deactivate** function to block maintenance plans for a certain period of time. The system then sets the status **INAK** in the maintenance plan. This blocks scheduling. Any planned dates still waiting are displayed as blocked. It is not possible to make calls in this status. You can deactivate a maintenance plan in the Change and Scheduling modes. You can reactivate blocked maintenance plans at any time.

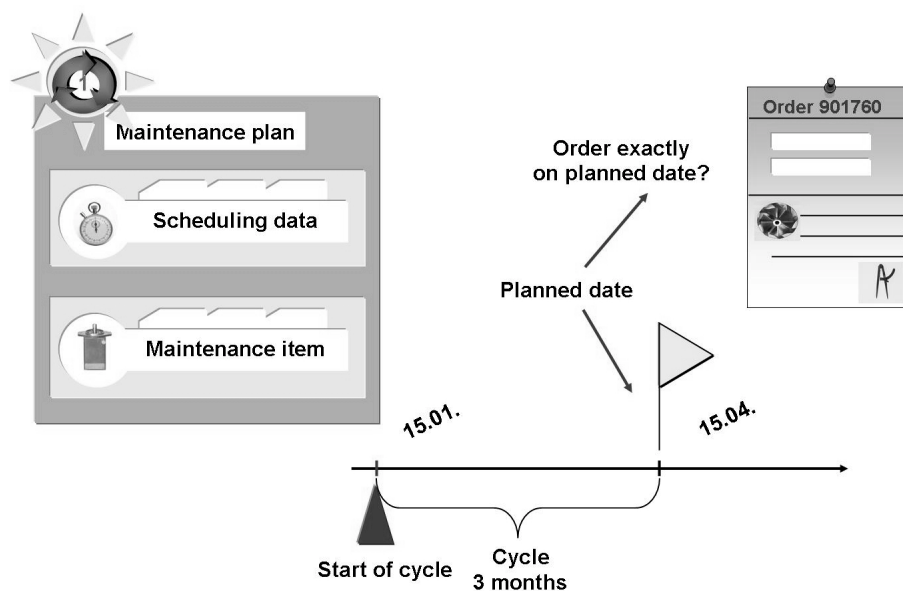


Figure 37: Cycle Start and Planned Date

When you create a single cycle plan, the **cycle** is assigned, that is, the period until each **planned date** (which is the due date of the measure). Orders are generated based on the planned date.

As a rule, however, the **call date (which is the order creation date)** falls before the planned date, to allow a certain lead time (for material procurement, for example).

The **cycle start** defines the date from which the calculation of the planned dates should begin.

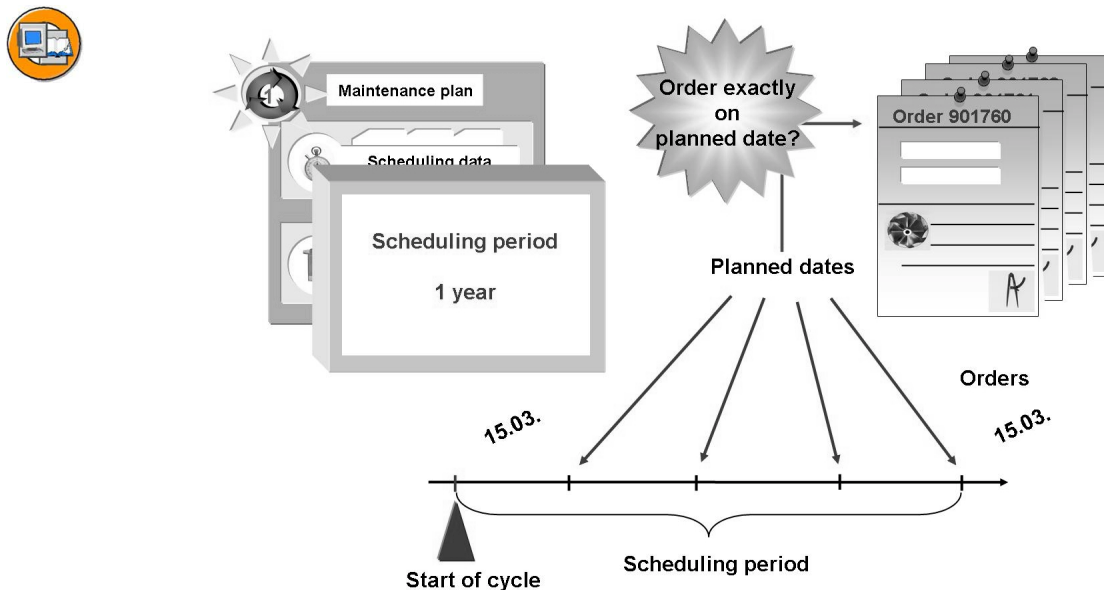


Figure 38: Scheduling period

The **scheduling period** is one of the scheduling parameters in the maintenance plan.

The scheduling period specifies the period for which planned dates should be calculated in advance.

The scheduling period can be used for time-based and performance-based preventive maintenance.

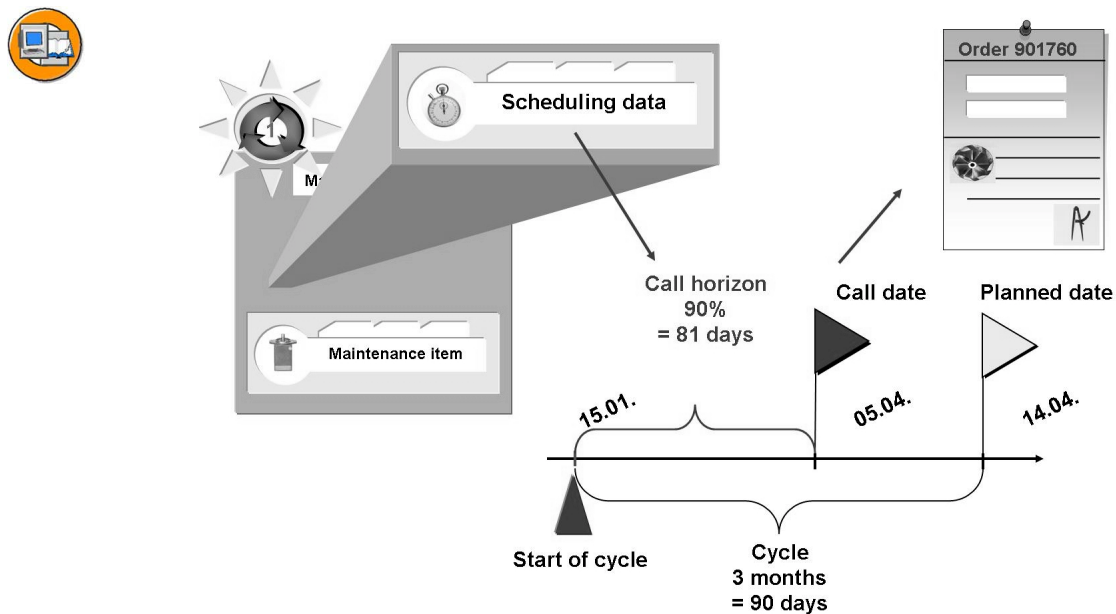


Figure 39: Call horizon

The **call horizon** scheduling parameter is used to define when the order (notification / service entry sheet) is actually generated compared to the planned date.

This detailed control of order generation enables you to make a preliminary run of planning the order before the planned date. The due maintenance task can thereby be performed and completed punctually on the planned date.

The call horizon is specified as a percentage of the cycle: 100% means that the order is generated exactly on the planned date. 0% would mean that the order is generated when the maintenance plan is started.

For a call horizon of 90% and a cycle of 3 months (= 90 days), the call - the generation of the order - would therefore occur after 81 days (= 90% of 90 days).

Note: Specifying the call horizon is not sufficient for the order to be generated, the maintenance plan must be scheduled for this.

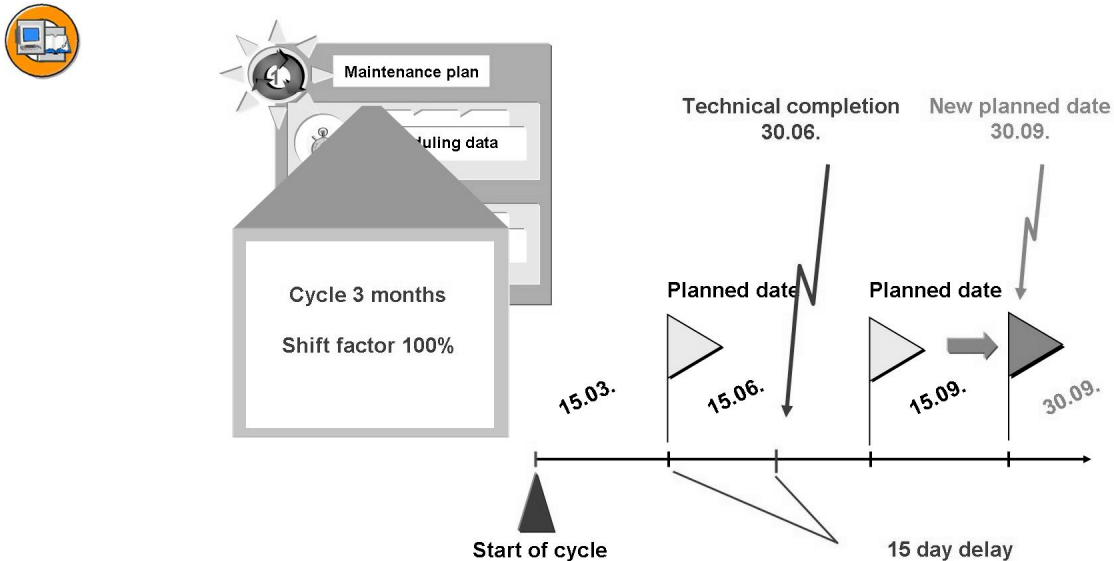


Figure 40: Shift factor and completion requirement

The **shift factor** enables you to react to an early or late completion of a call object. If the shift factor is 100%, the difference (earlier/later) will be added in full to the completion date to determine the new planned date.

If **completion requirement** is activated, the system only generates the next call object once the previous call object has been completed.

This has the following effects:

The next order is only created once the previous **order** has been **technically completed**. When the order has been completed, two different times can be specified:

- **Reference time** for the maintenance order (relevant for the order history)
- **Completion date** for calling the maintenance plan (relevant for further scheduling in the maintenance plan)

If the call object is a notification, the next notification is not created until the preceding **notification has been completed**.

If the call object is a service entry sheet, the next service entry sheet is not created until the preceding **service entry sheet has been accepted**.

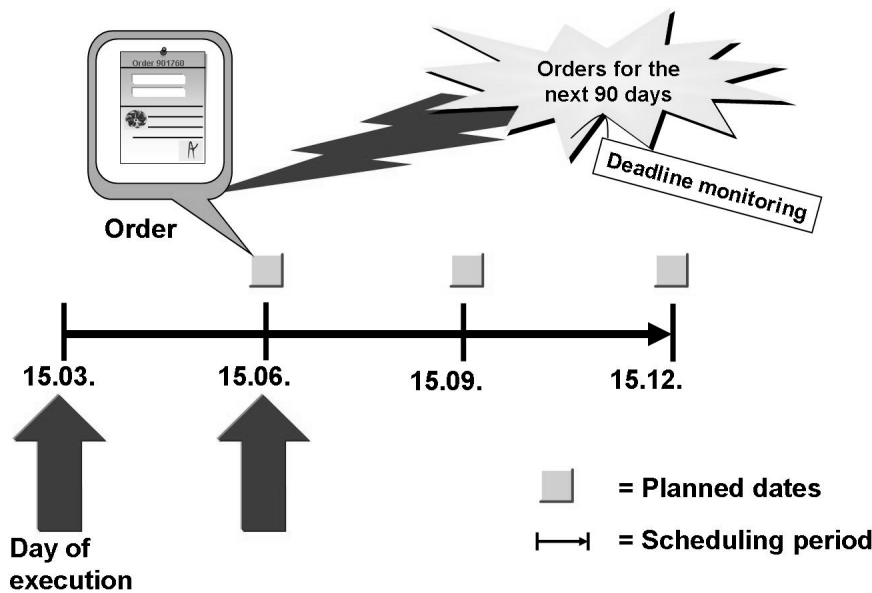


Figure 41: Deadline Monitoring

You can use **deadline monitoring** to monitor maintenance plans regularly. Two functions can be executed here:

Rescheduling: For example, if the scheduling parameters have changed since the last scheduling, deadline monitoring can execute a complete rescheduling. All the existing planned dates are deleted and recalculated.

Calling up orders/notifications/service entry sheets: In addition to rescheduling, waiting planned dates can be converted into orders. Here, a time period is specified in days. All planned dates and call dates, which lie within this period of time, are converted into orders.

Caution: Without deadline monitoring (or manual scheduling), the planned dates will not be recalculated and orders will not be generated.

Deadline monitoring is used in connection with the **call horizon** (for example, executing deadline monitoring daily and no entry in the "Orders" field for the next n days, combined with a call horizon of x% results in a preliminary run that corresponds exactly to the call horizon).

If no scheduling period is defined in the maintenance plan, a new planned date is added automatically when the current waiting call is converted into an order.

Deadline monitoring can be executed either in dialog or automatically by a system job.

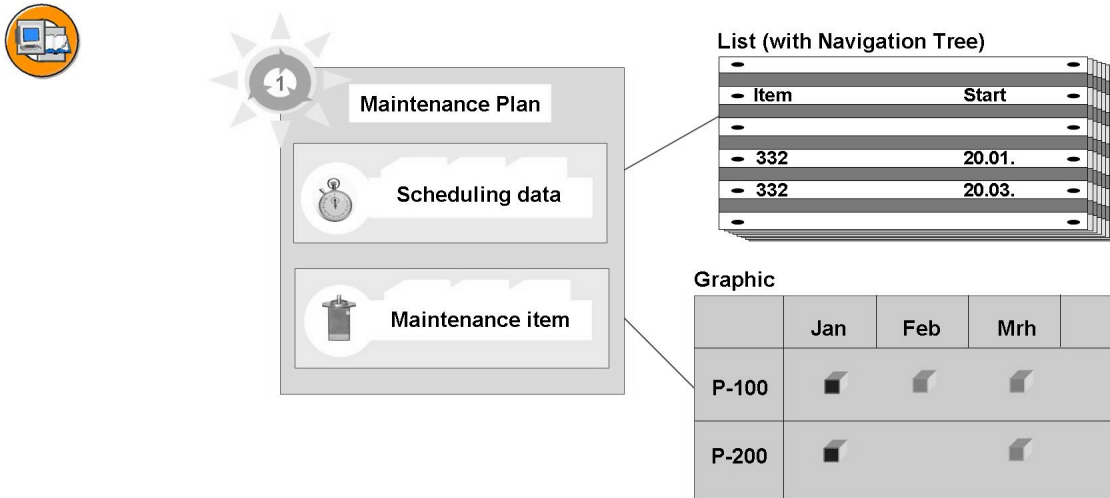


Figure 42: Scheduling Overviews

You can call scheduling overviews as a **list** or **graphic**.

The **list** contains the planned dates and call dates for each maintenance item. As an alternative to tabular display, as of SAP ECC 6.0 (SAP_APPL 600) you can use the **tabular display with navigation tree**.

In the **graphic**, planned dates and call dates are displayed in different colors according to their status.

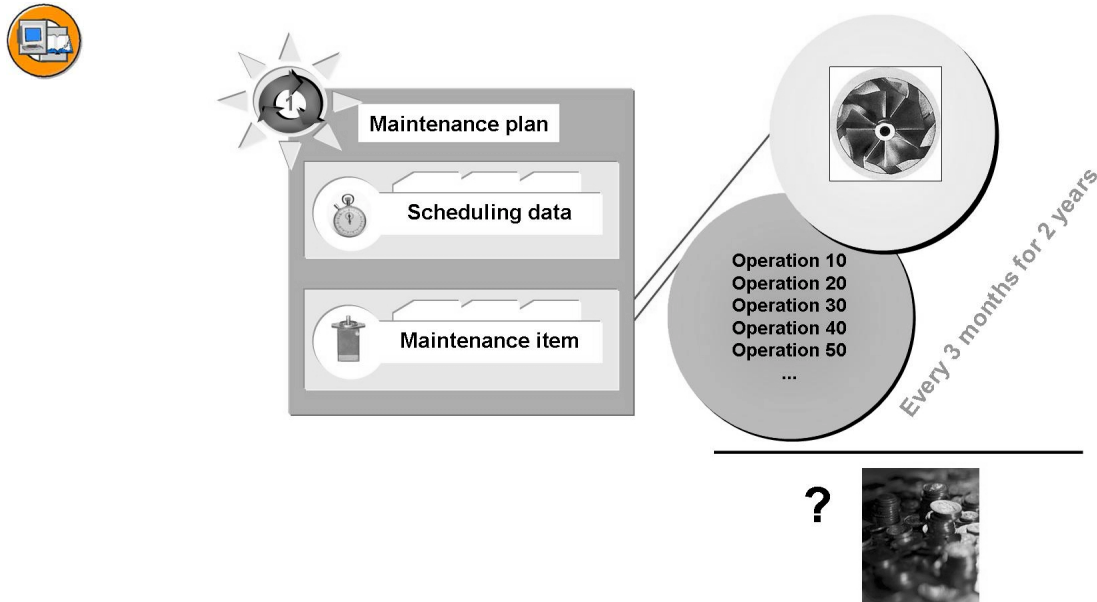


Figure 43: Maintenance Plan Cost Estimate

You can use the maintenance plan cost estimate to determine the costs of maintenance for a specific period.

Object-related cost estimate

You can determine the maintenance costs for a technical object for a specific period of time here. A call occurs after list editing has been performed for maintenance items (change mode only)

General costing

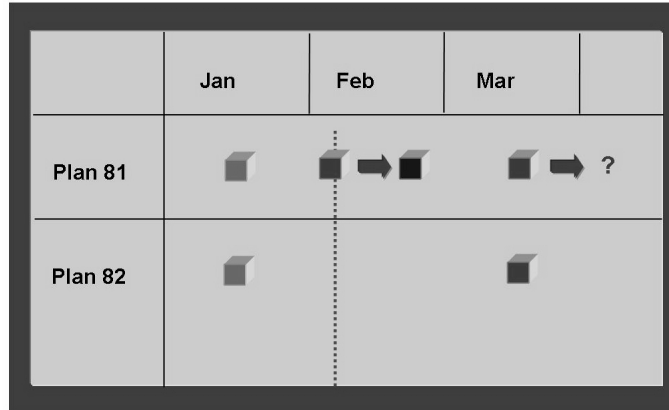
This allows you to calculate the maintenance costs for one or more maintenance plans.

In both cases, the active maintenance dates (waiting planned dates, calls - skipped dates are not considered) during the period in question are used for the cost estimate. If the period specified extends past the last active date, the system simulates the relevant dates.

Values are assigned to work time and material using the rates and prices valid **when the cost estimate is made**. Different rates (for example, for internal service) for future posting periods are not considered.



Maintenance scheduling overview  Maintenance plan simulation
Convert



Move planned dates
Display capacity loads

Figure 44: Maintenance plan simulation

You can switch from the graphical maintenance scheduling overview to the **maintenance plan simulation**.

Planned dates can be moved using Drag&Drop (either individually or with follow-up dates).

Capacity overviews can still be displayed for the performing work centers.

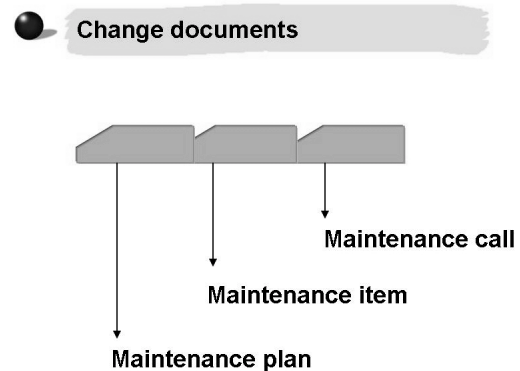
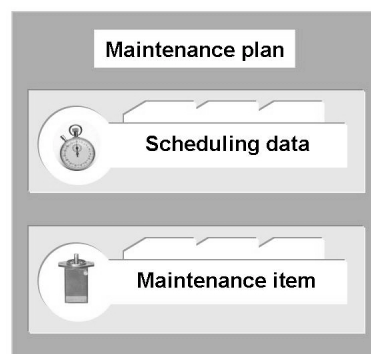


Figure 45: Change documents

Change documents can be created if fields are changed in the maintenance plan or maintenance item or if the maintenance calls are modified.

The creation of change documents must be activated in the maintenance plan category Customizing settings.

Exercise 5: Single Cycle Plan Scheduling

Exercise Objectives

After completing this exercise, you will be able to:

- Schedule a single cycle plan with the Order call object

Business Example

In the company, maintenance orders are to be created automatically as a result of daily scheduling of the single cycle plans.

Task:

1. Set up the following scheduling parameters in your maintenance plan:

Shift factor for late completion	0
Shift factor for early completion	0
Cycle modification factor	1
Call horizon	0
Scheduling period	1 year
Start of cycle	Today's date
Completion requirement	✓
Scheduling indicator	Time - factory calendar

Continued on next page

2. What effects do the parameters for call horizon, scheduling period and completion requirement have?

3. Start the maintenance plan using these scheduling parameters. What options are available?

4. How must the parameters be configured so that the call date (that is, the date the order is generated) falls exactly on the planned date?

5. How many orders are generated for this maintenance plan after three months have expired? Display the orders.

6. How has the situation changed after six months?



Hint: After the maintenance plan has been started, the cycle start date is no longer displayed in the scheduling parameters.

Solution 5: Single Cycle Plan Scheduling

Task:

1. Set up the following scheduling parameters in your maintenance plan:

Shift factor for late completion	0
Shift factor for early completion	0
Cycle modification factor	1
Call horizon	0
Scheduling period	1 year
Start of cycle	Today's date
Completion requirement	✓
Scheduling indicator	Time - factory calendar

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Change*

Go to the *Maintenance plan scheduling parameters* tab and enter parameters.



Hint: Maintain the factory calendar field if necessary

Continued on next page

2. What effects do the parameters for call horizon, scheduling period and completion requirement have?

Answer: Call horizon:

Determines when the order is generated with reference to the calculated planned date;

0% = Order immediately at start of maintenance plan

100% = Order exactly on planned date

All shades are possible in between

Scheduling period:

The period of time for which the planned dates will be calculated

Completion requirement:

If a maintenance order has been called, this must be technically completed, before the follow-up order can be generated. This prevents a second order being called up if processing of the first order is delayed.

3. Start the maintenance plan using these scheduling parameters. What options are available?

Answer: First option:

SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule Edit → Start

Second option:

SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Deadline Monitoring

Prerequisite: You have already entered a cycle start in the maintenance plan

Selection of maintenance plans using maintenance plan number, maintenance plan category or sort field

Note: The *Rescheduling incl.* and *Immediate start for all* indicators must be selected.

4. How must the parameters be configured so that the call date (that is, the date the order is generated) falls exactly on the planned date?

Answer: The call horizon must be set to 100%.

Continued on next page

5. How many orders are generated for this maintenance plan after three months have expired? Display the orders.

Answer: One order is always generated for each maintenance item. Therefore, two orders are generated for the current maintenance plan.

The orders can be displayed in two ways:

In display/change mode ⇒ on the *Maintenance plan schedule calls* tab page

In scheduling mode ⇒ on the *Scheduled calls* tab page

6. How has the situation changed after six months?



Hint: After the maintenance plan has been started, the cycle start date is no longer displayed in the scheduling parameters.

- a) If the maintenance plan is “not amended further”, there is **no action** after six months, in other words, when the second order is due.

The maintenance plan must be scheduled, so that orders are generated. To this end, **deadline monitoring** is to be executed automatically at regular intervals (system job).



Lesson Summary

You should now be able to:

- Configure the scheduling parameters
- Schedule a single cycle plan

Lesson: Calling Notifications

Lesson Overview

This lesson demonstrates the automatic call of notifications from maintenance plans.



Lesson Objectives

After completing this lesson, you will be able to:

- Create and schedule a single cycle plan with the Notification call object

Business Example

Because they are short, some inspections in the company need to be mapped using notifications rather than maintenance orders.

Calling Notifications

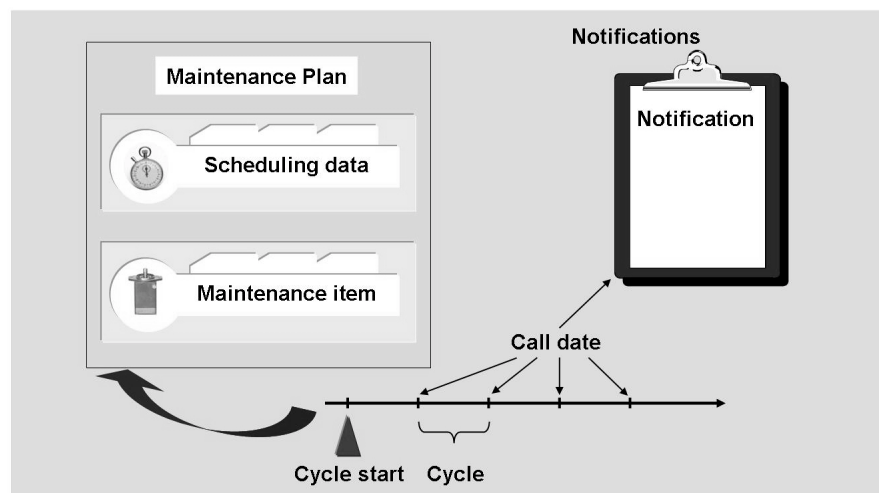


Figure 46: Calling Notifications

Maintenance plans can generate maintenance notifications automatically. This is often the case if the maintenance task initially only comprises a brief routine inspection that does not necessitate an order. Here you could use a maintenance request.

If the check identifies damage or a malfunction, an order can be created based on the request.

The *Notification* call object is selected when the maintenance plan is created using the **category** of maintenance plan.

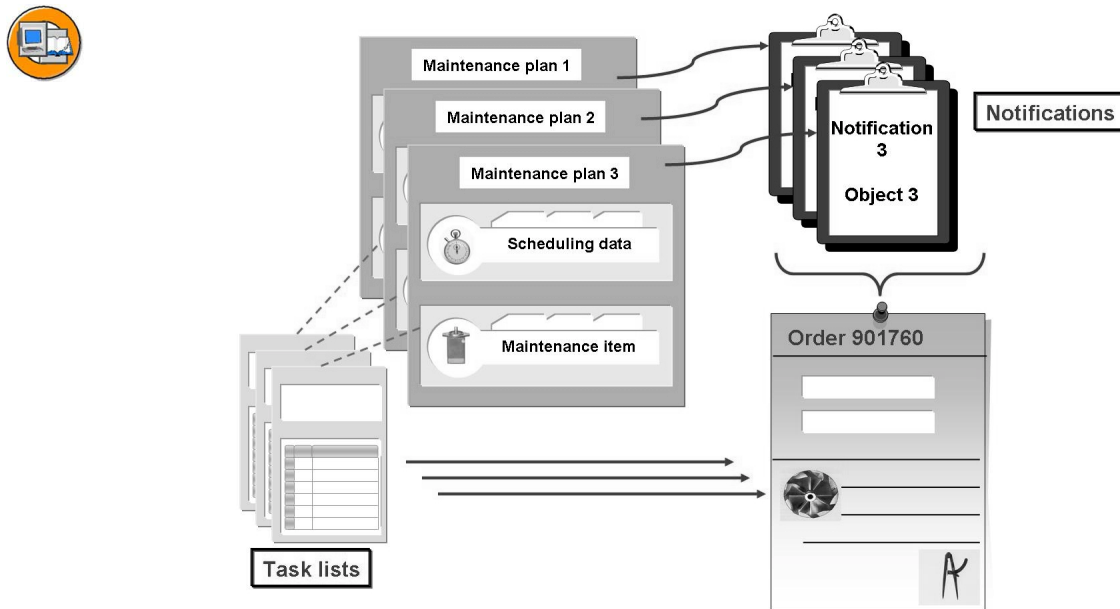


Figure 47: Worklist for Call Object 'Notification'

If the maintenance of a technical system, which consists of system parts with different maintenance cycles, should be processed within an order, this can be performed using a worklist of requests (notifications).

The individual maintenance plans hereby generate maintenance requests for the respective part of the system. At time X, all requests for the technical system are collected and converted into an order. The task lists from the relevant maintenance item are then copied to the order.

The object, for which the task should be performed, is clear for each operation in the order.

The reference object for the order is usually the superior technical system (for example, the functional location), to which the order costs are settled.

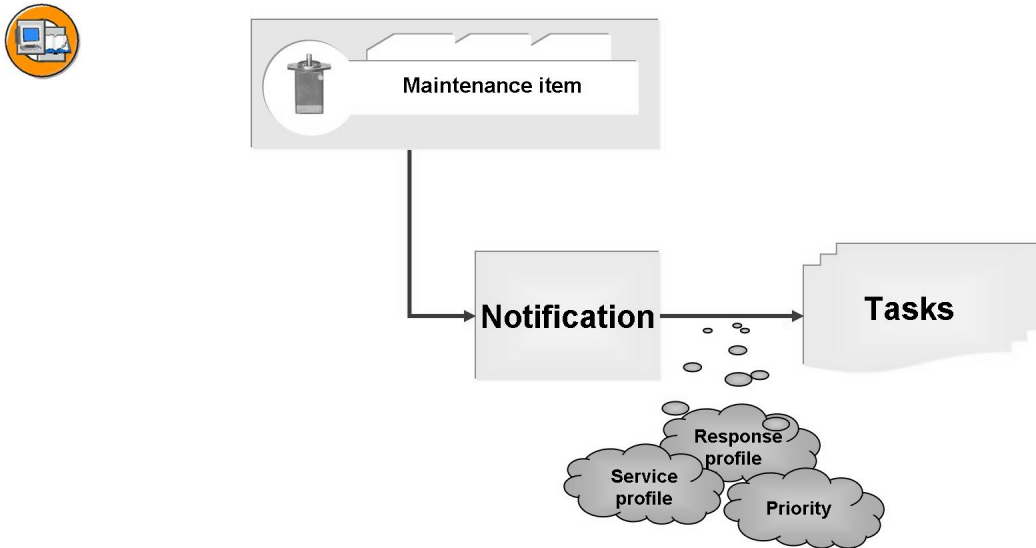


Figure 48: Automatic Tasks

Automatic determination of tasks:

- You can trigger automatic task determination for maintenance plans, which generate a notification as a call object.
- If a notification is generated, the system uses the **response profile**, **service profile** and **priority** to determine at which times, and over which time period, certain tasks must be performed for this notification.
- **For example:**

Maintenance requests should first be generated for the routine inspection of water pumps for biological cleaning at the clarification plant, since often the work required is minimal with negligible costs, and is therefore not processed using an order. The steps to be executed can be defined automatically as tasks in the maintenance request (depending on the notification type).

Internal Use SAP Partner Only

Internal Use SAP Partner Only

Exercise 6: Calling Notifications

Exercise Objectives

After completing this exercise, you will be able to:

- Create and schedule a single cycle plan with the Notification call object

Business Example

In the company, short inspections should only be mapped by automatically generated notifications, and not by maintenance orders.

Task 1:

For the brief inspection of functional location **##-B02-2A** (inlet), a maintenance request is to be generated at 6-month intervals. This request is only to be converted into an order if the inspection determines that the location is damaged or malfunctioning.

1. How do you create the maintenance plan?

Which notification type did you enter?

Enter today's date as the cycle start and calculate planned dates for two years.
How do you do this?



Hint: You can enter the cycle start on the *Scheduling parameters* tab when creating the maintenance plan.

If you do not enter a cycle start, a prompt appears when you save the maintenance plan.

What maintenance plan number does the system assign?

Start the maintenance plan and check the calls. How do you do this?

Continued on next page

Task 2:

Complete the maintenance tasks for pumps and pump motors in pump section 1 of biological cleaning **K1-B** using as few orders as possible.

Group into one order the requests generated by different maintenance plans that are available at a certain time.

1. Create a single cycle plan for pump **P-1000-N0001** with the following data:

Maintenance plan category	Notification
Cycle	6 months
Reference object (equipment)	P-1000-N001
Notification type	M1
Maintenance planner group	I##
Task List	A PUMP_WTG 1
Call horizon	0
Scheduling period	1 year
Start of cycle	Today's date

2. Create a single cycle plan for pump motor **M-1000-N051** with the following data:

Maintenance plan category	Notification
Cycle	5 months
Reference object (equipment)	M-1000-N051
Notification type	M1
Maintenance planner group	I##
Task List	A PUMP_WTG 2
Call horizon	0
Scheduling period	1 year
Start of cycle	Today's date

3. Start both maintenance plans. How do you do this?

Check the notification date and the required start date for the two notifications created. What are the relevant dates?

Continued on next page

-
-
4. Maintenance is to be carried out for the pumps and motors in pump section 1 of biological cleaning **K1-B**.

Select all the requests created for your planner group in pump section 1 and assign them to a new order.

How do you do this?

Which reference object appears by default in the order? Do you need to change this?

Which entries appear in the operation list for the order?

How are the work steps assigned to the object?

Solution 6: Calling Notifications

Task 1:

For the brief inspection of functional location **##-B02-2A** (inlet), a maintenance request is to be generated at 6-month intervals. This request is only to be converted into an order if the inspection determines that the location is damaged or malfunctioning.

1. How do you create the maintenance plan?

Which notification type did you enter?

Enter today's date as the cycle start and calculate planned dates for two years.
How do you do this?



Hint: You can enter the cycle start on the *Scheduling parameters* tab when creating the maintenance plan.

If you do not enter a cycle start, a prompt appears when you save the maintenance plan.

What maintenance plan number does the system assign?

Start the maintenance plan and check the calls. How do you do this?

Continued on next page

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan*

Leave the maintenance plan number field blank (this entry is assigned internally, but can also be assigned externally).

Field name or data type	Values
Maintenance plan category	Notification
Notification type	M1
Start of cycle	Today's date
Scheduling period	2 YR

SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule

Edit → Start

Save. Open the maintenance plan again (scheduling mode), select the first line (if this contains a call) and select *Display call object* (glasses icon).

Task 2:

Complete the maintenance tasks for pumps and pump motors in pump section 1 of biological cleaning **K1-B** using as few orders as possible.

Group into one order the requests generated by different maintenance plans that are available at a certain time.

1. Create a single cycle plan for pump **P-1000-N0001** with the following data:

Maintenance plan category	Notification
Cycle	6 months
Reference object (equipment)	P-1000-N001
Notification type	M1
Maintenance planner group	I##
Task List	A PUMP_WTG 1

Continued on next page

Call horizon	0
Scheduling period	1 year
Start of cycle	Today's date

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan*

Enter the parameters specified. Save your entries.

2. Create a single cycle plan for pump motor **M-1000-N051** with the following data:

Maintenance plan category	Notification
Cycle	5 months
Reference object (equipment)	M-1000-N051
Notification type	M1
Maintenance planner group	I##
Task List	A PUMP_WTG 2
Call horizon	0
Scheduling period	1 year
Start of cycle	Today's date

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan*

Enter the parameters specified. Save your entries.

3. Start both maintenance plans. How do you do this?

Check the notification date and the required start date for the two notifications created. What are the relevant dates?

Continued on next page

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Deadline Monitoring*

Field name or data type	Values
Maintenance plan	Enter maintenance plan numbers
Call objects for n days	0
Rescheduling incl.	✓
Immediate start for all	✓

Execute (F8)

SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Display or Change

Select the *Maintenance plan scheduled calls* tab.

Field name or data type	Values
Notification date	Today's date
Required start date	Today's date + 180 or 150 days

4. Maintenance is to be carried out for the pumps and motors in pump section 1 of biological cleaning **K1-B**.

Select all the requests created for your planner group in pump section 1 and assign them to a new order.

How do you do this?

Which reference object appears by default in the order? Do you need to change this?

Which entries appear in the operation list for the order?

How are the work steps assigned to the object?

Continued on next page

- a) *SAP Menu → Logistics → Plant Maintenance → Maintenance Processing → Notification → List Editing → Change*

Field name or data type	Values
Notification status	Outstanding
Notification type	M1
Planner group	I##
Functional location	K1-B*

Select notifications, and choose *Generate Order*.

Field name or data type	Values
Created by	PLM310-##
Reference object	Reference object of first notification
Retain reference object?	Possible in this case, since both objects form an equipment hierarchy. In the case of several independent objects, the next highest functional location should be made the reference object.
Operation list for order	Consists of the two task lists from the maintenance items in the maintenance plans
Assignment of work step - object	Operations tab pageEquipment column



Lesson Summary

You should now be able to:

- Create and schedule a single cycle plan with the Notification call object

Lesson: Calling External Services

Lesson Overview

This lesson demonstrates how to access service entry sheets from an individual cycle maintenance plan for the regular procurement of external services.



Lesson Objectives

After completing this lesson, you will be able to:

- Create and schedule a single cycle plan with the Service Entry Sheet call object

Business Example

Certain inspection and maintenance work should be carried out regularly by external companies. The maintenance plan should generate service entry sheets for a framework order.

Calling External Services

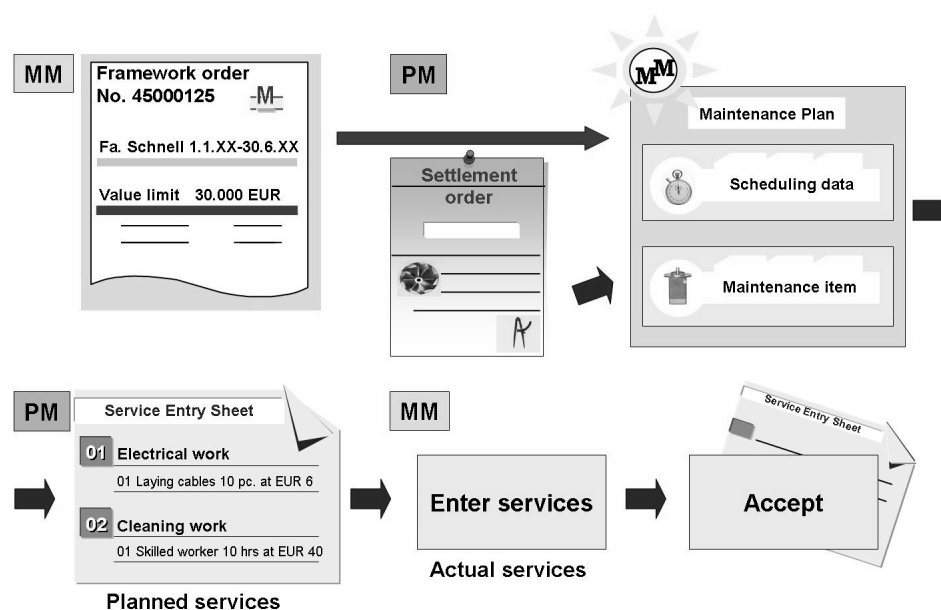


Figure 49: Process for Maintenance-Plan-Based Service Procurement

Sequence of steps for maintenance-plan-based service procurement:

1. Create a framework order (MM)
2. Create a settlement order (PM)
3. Create maintenance plan and enter the required services (PM)
4. Generate a service entry sheet (schedule maintenance plan) (PM)
5. Enter services (MM)
6. Accept the service entry sheet (MM)



Note: PM stands for the SAP component *Plant Maintenance*, MM stands for the SAP component *Materials Management*.



Framework Order		M
No. 45000125		
Fa. Schnell	1.1.XX - 30.6.XX	
Value limit	30.000 EUR	

Arrows point from the **Vendor** and **Value limit** labels to the corresponding fields in the form.

Figure 50: Create a framework order (MM)

1. Create a framework order

A **framework order** (category: **FO**) must first be created in Materials Management (Purchasing). The **vendor** and a **value limit** are entered.

Entries are not required for the service specifications.

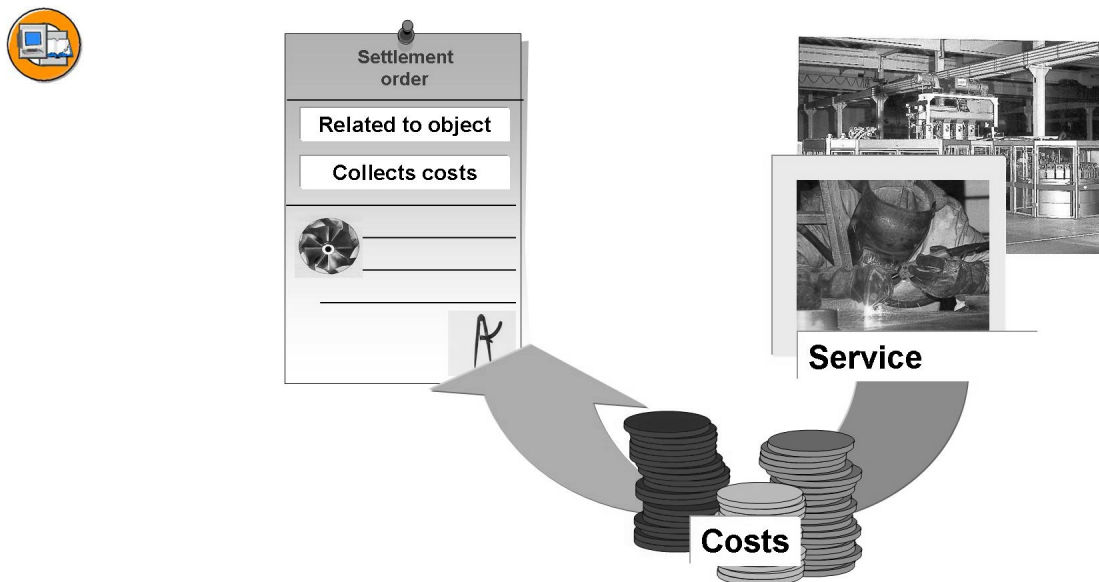


Figure 51: Create a settlement order (PM)

2. Create a settlement order

In Plant Maintenance, an order is created with reference to an object. This order is used as a settlement order and collects the costs.

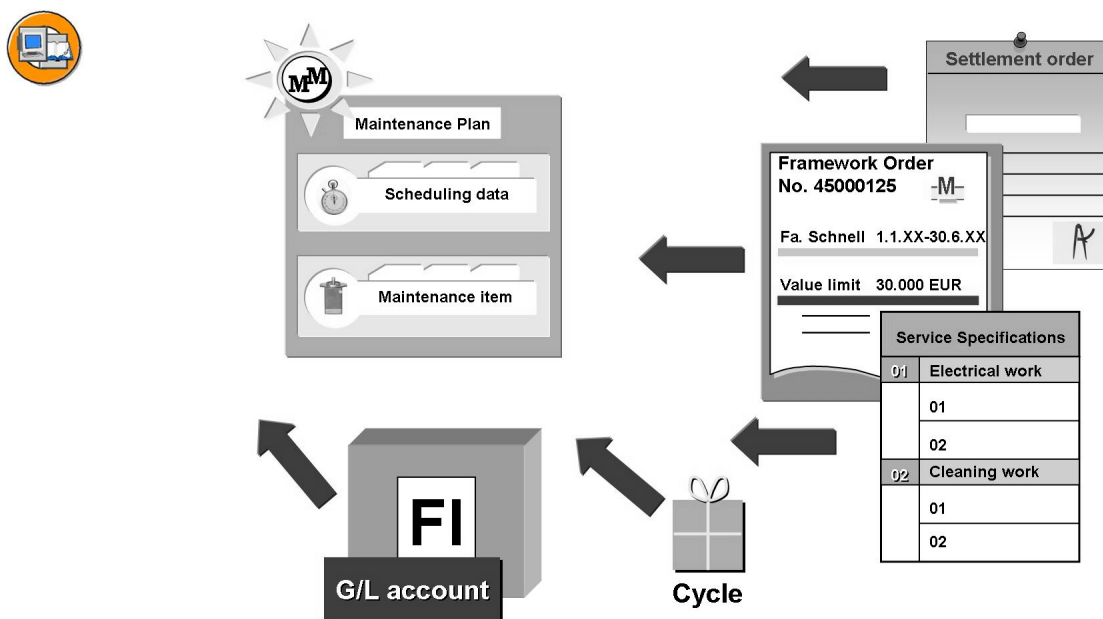


Figure 52: Create a Maintenance Plan (PM)

3. Create maintenance plan

A **maintenance plan** (type *MM*) is still created with reference to the **framework order** and to the **settlement order**.

A **G/L account** must be entered in the maintenance plan for updating costs in G/L accounting.

Costs are updated in Controlling using the **settlement order**.

The services to be performed can be entered using **service specifications** (standard or model service specifications).

Services can also be entered manually with reference to different purchasing documents (contract, purchase order, purchase requisition, quotation) or a service master record (MM). You can use the outline function to assemble new service specifications from individual services.

Pricing is determined using the conditions recorded at the level of service (service master record), vendor and service, or plant, vendor and service.

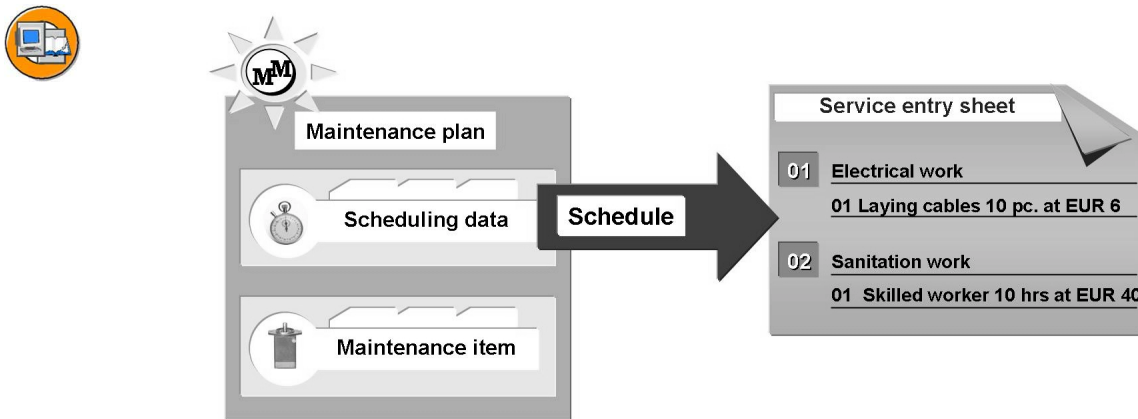


Figure 53: Generating a Service Entry Sheet (PM)

4. Generate a service entry sheet

The scheduling of the maintenance plan is used to calculate a planned date for which the services are called. When the services are called up, a service entry sheet is automatically generated for the framework order.



Hint: When the service entry sheet is called, the external company can be notified automatically (for example, by automatic fax or e-mail) using the MM messaging function.

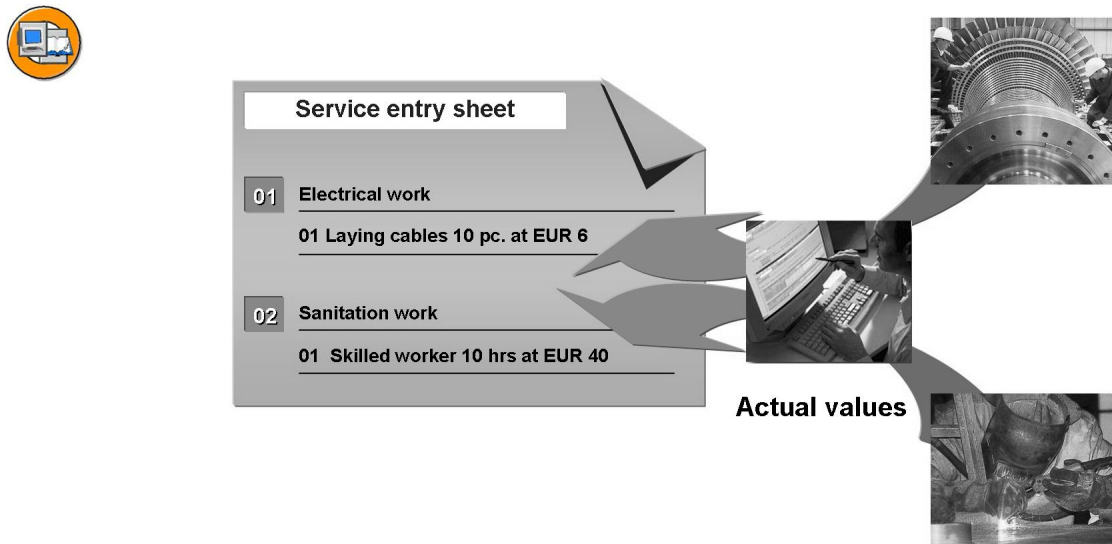


Figure 54: Enter services (MM)

5. Enter services

In Materials Management, the service entry sheet is updated for the purchase order. This means that the actual services and prices are entered, in case these differ from the values previously entered. When the actual values are entered, they are checked against the value limit in the framework order.

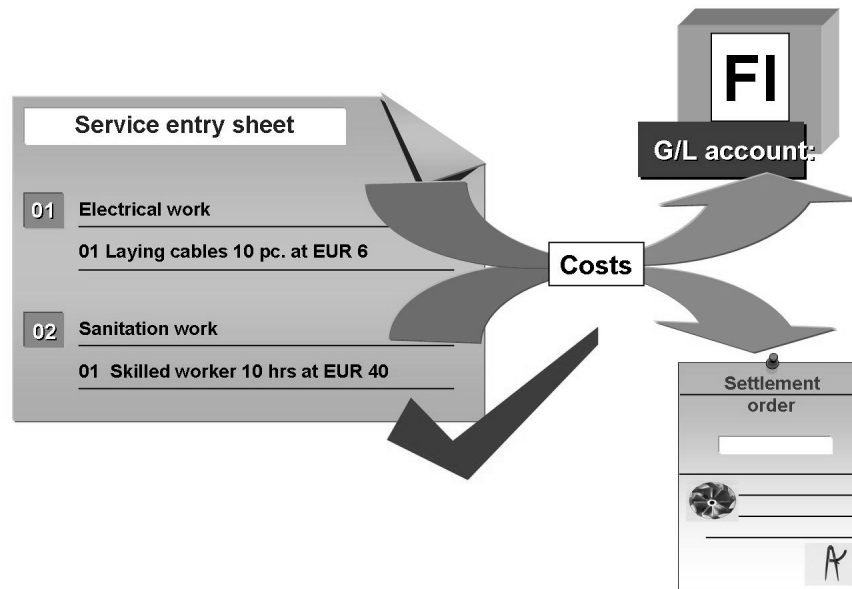


Figure 55: Acceptance (MM)

6. Accept the service entry sheet

In Materials Management, the service entry sheet is accepted after the services have been entered. The costs are then updated in both the settlement order in PM and the G/L account entered in the maintenance plan.

Note: The settlement order must be **released** in order for the costs to be debited.

7. Further steps

More planned dates for calls can be generated by carrying out deadline monitoring for the maintenance plan again.

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Exercise 7: Calling External Services

Exercise Objectives

After completing this exercise, you will be able to:

- Create and schedule a single cycle plan with the Service Entry Sheet call object

Business Example

In the company, certain inspection work should be carried out regularly by external companies. This is to be supported by the automatic call of service entry sheets.

Task 1:

Determine the purchase order number of the framework order for vendor **1006** (Blacks AG), who orders an inspection of smoke alarms and fire extinguishers as a service.

1. How do you proceed?

What is the number of the purchase order?

Task 2:

Create a settlement order for the functional location **K1**.

1. Which order number does the system assign?

Put the order in process and make a note of the order number.

Task 3:

1. Create a maintenance plan for entering services performed. Which maintenance plan category do you choose?

Use the following data:

Continued on next page

Field name or data type	Values
Cycle	1 year
Purchase order number	See above
G/L account:	417000
Order number	See above
Services	100131, 100132

Task 4:

Start the maintenance plan.

1. Under which number is the service entry sheet created?

Task 5:

Enter the actual data and then accept the service entry sheet.

1. How do you proceed?

Solution 7: Calling External Services

Task 1:

Determine the purchase order number of the framework order for vendor **1006** (Blacks AG), who orders an inspection of smoke alarms and fire extinguishers as a service.

1. How do you proceed?

What is the number of the purchase order?

- a) *Logistics → Materials Management → Purchasing → Purchase Order → List Displays – By Vendor*

Field name or data type	Values
Vendor	1006 (Blacks AG)
Purchasing organization	1000
Document type	FO (framework order)
Purchasing group	001
Item category	D
Result	Purchase order 45000xxxxx

Task 2:

Create a settlement order for the functional location **K1**.

1. Which order number does the system assign?

Put the order in process and make a note of the order number.

- a) *SAP Menu → Logistics → Plant Maintenance → Maintenance Processing → Order → Create (General)*

Use the button *In Process*.

Continued on next page

Task 3:

1. Create a maintenance plan for entering services performed. Which maintenance plan category do you choose?

Use the following data:

Field name or data type	Values
Cycle	1 year
Purchase order number	See above
G/L account:	417000
Order number	See above
Services	100131, 100132

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan*

Field name or data type	Values
Maintenance plan category	Service provided

Task 4:

Start the maintenance plan.

1. Under which number is the service entry sheet created?

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule*
Edit → Start

Continued on next page

Task 5:

Enter the actual data and then accept the service entry sheet.

1. How do you proceed?

-
- a) ***SAP menu → Logistics → Plant Maintenance → Maintenance Processing → Completion Confirmation → Services***

Choose the *Other Purchase Order* key and enter the purchase order number;

Click on the service entry sheet in the document overview (left-hand column);

Switch from display to change mode (*yellow pencil*) key

Change the service quantity, if necessary;

Choose the *Accept* key (green flag) and save;

Set document and posting date to today's date.



Lesson Summary

You should now be able to:

- Create and schedule a single cycle plan with the Service Entry Sheet call object

Lesson: Maintenance Plan Customizing

Lesson Overview

This lesson shows the Customizing settings for maintenance plans.



Lesson Objectives

After completing this lesson, you will be able to:

- Make the settings for maintenance plans

Business Example

The project team defines various maintenance plan categories and configures these in Customizing.

Customizing

Maintenance plan category

You can use the maintenance plan category to configure the call object to be generated.

Completion data

Here you can specify that call dates be completed separately. This means that the completion date for the maintenance plan can be specified separately from the order reference date.

Number range

The maintenance plan category is assigned to a number range.

Default order type for maintenance item

The order type proposed automatically in the maintenance item when a maintenance plan is created can be configured in this option.

Adapt order type

For the order type, you must define whether the system should automatically release the maintenance order when it is generated. This setting is made in Customizing for Maintenance and Service Processing (configure option for order types).

Settings for the graphical scheduling overview

In this option, you can set the default parameters and, in particular, the timeframe from the graphical scheduling overview. These also affect the scheduling overview, which is started from the object information in the order or notification.



Lesson Summary

You should now be able to:

- Make the settings for maintenance plans



Unit Summary

You should now be able to:

- Describe the different areas of maintenance planning
- Create a single cycle plan with the Order call object
- Schedule a single cycle plan
- Configure the scheduling parameters
- Schedule a single cycle plan
- Create and schedule a single cycle plan with the Notification call object
- Create and schedule a single cycle plan with the Service Entry Sheet call object
- Make the settings for maintenance plans

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Unit 4

Maintenance Planning with Strategy: Time-Based

Unit Overview

This unit follows on from the unit *Preventive Maintenance* in course PLM300, recaps terminology and concepts relating to maintenance planning with strategy (time-based), and describes detailed functions and the required Customizing settings.



Unit Objectives

After completing this unit, you will be able to:

- Describe the structure and functions of a maintenance strategy
- Assign the maintenance strategy to the task list
- Assign maintenance packages to operations
- Create a time-based strategy plan
- Schedule a time-based strategy plan

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Lesson: Maintenance Strategy

Lesson Overview

This lesson shows the structure of a maintenance strategy.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the structure and functions of a maintenance strategy

Business Example

The project team wants to plan maintenance for some machines on a time basis using cycles that follow on from one another.

Maintenance strategy

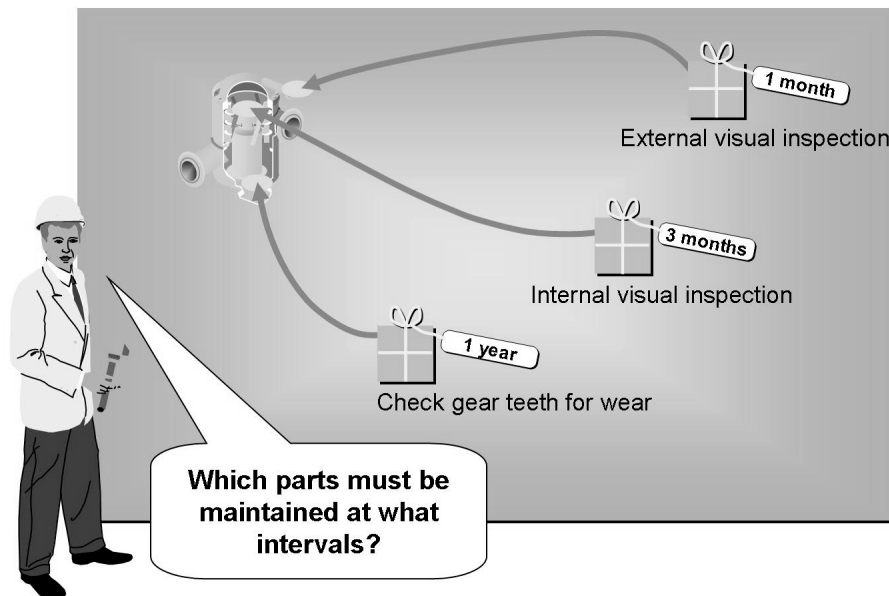


Figure 56: Maintenance planning with strategy business process

The individual components of your technical objects must be maintained at different intervals. For example, an external visual inspection for rust and water-tightness is performed on the water pumps at your company each month. However, the wear in the gear box for the pump is only checked once every year.

From the different maintenance intervals (for example, monthly, yearly), a **maintenance strategy** can be assembled, which can be used to plan and perform maintenance easily and efficiently.

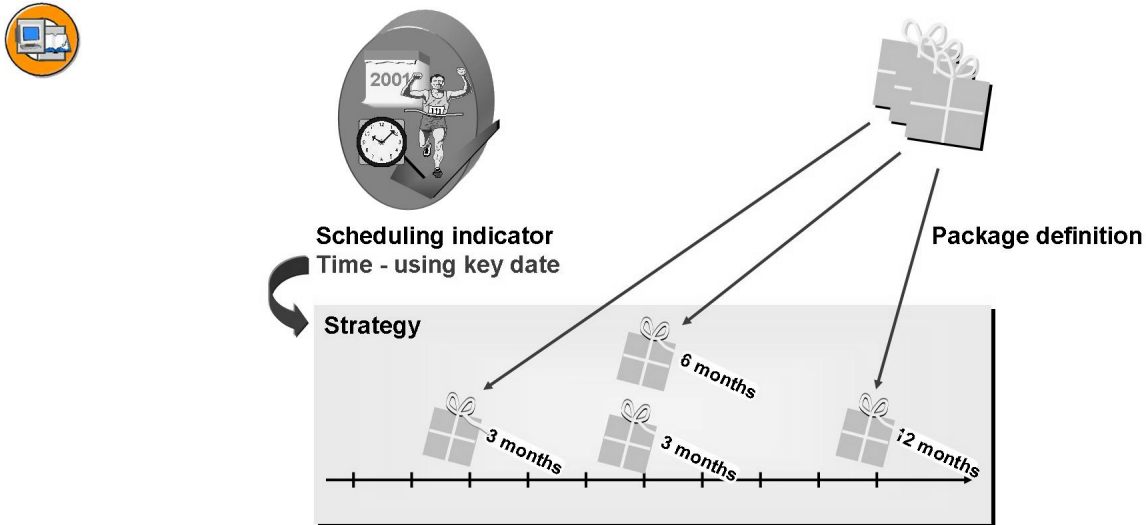


Figure 57: Maintenance Strategy

The **maintenance strategy** consists of several maintenance packages and incorporates the scheduling rule for preventive maintenance. **Task lists** can be assigned to maintenance strategies.

The time-dependent maintenance strategy uses the following parameters:

- Scheduling indicator (time: calendar-based, time: using key date, time: using factory calendar)
- Call horizon
- Shift factors and tolerances
- Time - factory calendar
- Package sequence and where-used list

You can assign any number of **maintenance packages** to a maintenance strategy. Note that the maintenance packages for a strategy should not have different cycle units (for example, month, year). A strategy consisting of one month and one year should be defined as one month and twelve months.

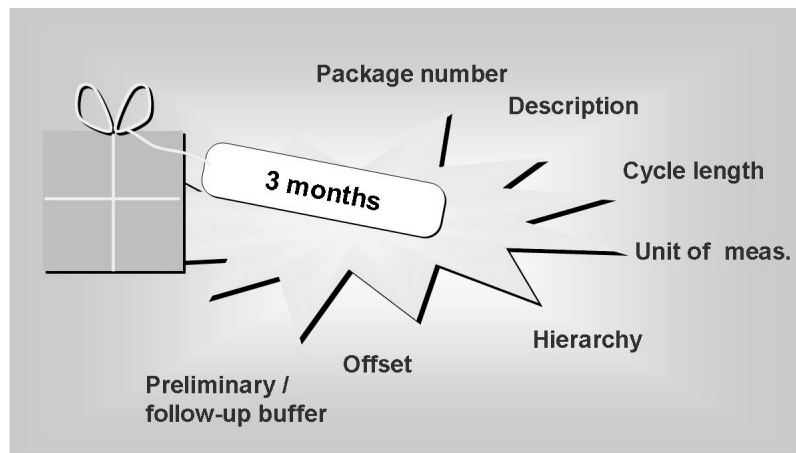


Figure 58: Maintenance Package

Maintenance packages are part of a **maintenance strategy**.

Maintenance packages define the frequency at which specific operations are carried out. They are assigned to the **operations** in a task list.

Important parameters for a maintenance package are:

- **Maintenance package number**
- **Description**
- **Cycle length**
- **Unit of measurement**
- **Hierarchy**

If two maintenance packages are due at the same time, the hierarchy defines which maintenance package is performed.

- **Offset**

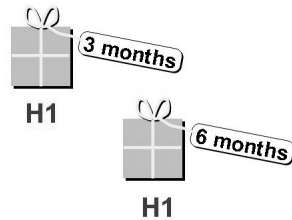
The offset determines the first due date of a maintenance package.

- **Initial and Subsequent buffers**

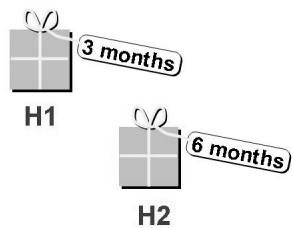
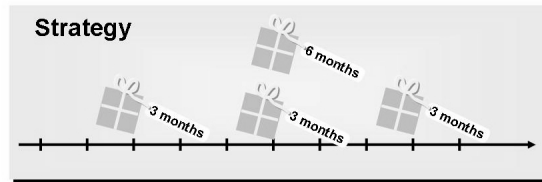
The initial and subsequent buffers are specified in days with reference to the planned date and sets the start and end dates for a maintenance order.



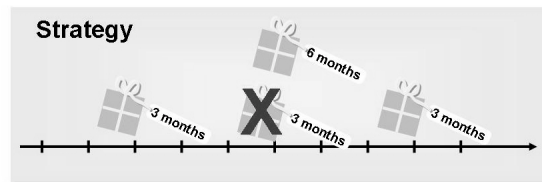
Hint: If you set one of the two buffers to 0, the planned date can still be displayed later in the order.



Same hierarchy levels



Different hierarchy levels

**Figure 59: Hierarchy of Maintenance Packages**

The **hierarchy** of maintenance packages defines whether all maintenance packages that coincide should be executed, or whether certain maintenance packages should be ignored. For this reason, a **hierarchy level** is assigned to each maintenance package.

If maintenance packages with the same hierarchy level coincide, these maintenance packages are executed.

If maintenance packages have different hierarchy levels, the maintenance package with the lower level is not executed.

For example:

For vehicle maintenance, the spark plugs are to be cleaned every three months and changed every six months. In order that cleaning and changing are not both carried out after six months (which would mean that the spark plugs would firstly be cleaned and then thrown away), the 6-month package (change spark plugs) is assigned a higher hierarchy than the 3-month package (clean spark plugs), and the latter is deactivated.

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Exercise 8: Maintenance Strategy

Exercise Objectives

After completing this exercise, you will be able to:

- Maintain a maintenance strategy

Business Example

In the company, maintenance work on particular technical systems is carried out at specific time intervals. For example, an external visual inspection is to be carried out on all water pumps every three months, and an internal visual inspection every six months.

Task:

Display the maintenance strategies that are available in the system.

1. Which maintenance packages are used for **calendar-based** scheduling?

Display the detail view for this strategy. How do you do this?

Continued on next page

2. Which hierarchy level is assigned to the yearly maintenance package and what significance does this have?

3. What hierarchy levels do the 1-monthly and 3-monthly packages have and what affect does this have?

4. What should you be aware of when selecting the cycle units for packages using hierarchies?

5. How do you create a package, so that it is executed just once?

6. How do you create a package, so that it is executed using the actual cycle but only after a certain period?

Solution 8: Maintenance Strategy

Task:

Display the maintenance strategies that are available in the system.

1. Which maintenance packages are used for **calendar-based** scheduling?

Display the detail view for this strategy. How do you do this?

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Strategies → Display*

Field Name or Data Type	Values
<i>Strategy A (calendar-based)</i>	Monthly
	3-monthly
	Yearly

Select strategy in the strategy overview, choose Detail (*magnifying glass icon*) or F2.

2. Which hierarchy level is assigned to the yearly maintenance package and what significance does this have?

Answer: The yearly package has hierarchy level **H2**.

This therefore replaces all packages with hierarchy level **H1** if these are due at the same time.

3. What hierarchy levels do the 1-monthly and 3-monthly packages have and what affect does this have?

Answer: 1-monthly and 3-monthly packages are both hierarchy level **H1** packages. This means that both packages are executed even if they are due at the same time.

4. What should you be aware of when selecting the cycle units for packages using hierarchies?

Continued on next page

-
-
- a) Choose the cycle units so that the packages coincide with one another.

For example:

1 year = 365 days

12 months = 12 x 30 = 360 days

In other words, at the end of the year, a 3-monthly package would not coincide exactly with a yearly package. Therefore, the hierarchy is not active and both packages are executed.

In the case of monthly and yearly packages, define the yearly package as a 12-monthly package.

5. How do you create a package, so that it is executed just once?

Answer: Only maintain the offset in the package.

6. How do you create a package, so that it is executed using the actual cycle but only after a certain period?

Answer: You must maintain both the offset and the cycle in the package.



Lesson Summary

You should now be able to:

- Describe the structure and functions of a maintenance strategy

Lesson: Task List and Maintenance Strategy

Lesson Overview

This lesson shows how a maintenance strategy is assigned to a task list.



Lesson Objectives

After completing this lesson, you will be able to:

- Assign the maintenance strategy to the task list
- Assign maintenance packages to operations

Business Example

The project team prepares the task lists for time-based maintenance planning with strategy.

Task List and Maintenance Strategy

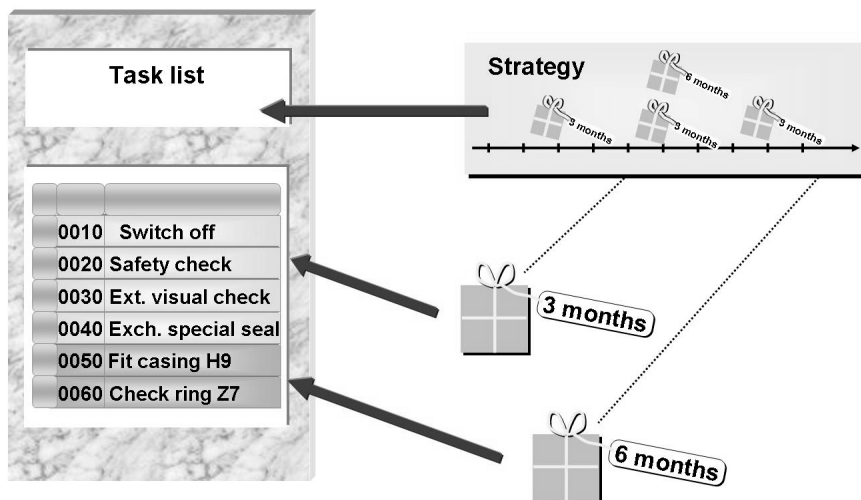


Figure 60: Task List and Maintenance Strategy

You can create task lists for use in preventive maintenance. To prepare task lists for use in **strategy plans**, the following steps are required:

- A **strategy** is defined in the task list header.
- The **maintenance packages for the strategy** are assigned to the **operations** in the task list. In this way, the frequency with which the operations should be executed is defined.

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Exercise 9: Task List and Maintenance Strategy

Exercise Objectives

After completing this exercise, you will be able to:

- Assign a maintenance strategy to a task list

Business Example

The company wants to set up task lists for strategy-based maintenance

Task:

In the task list group **PM-##**, create a new general maintenance task list and assign a maintenance strategy with which you can carry out key-date scheduling.

1. Which maintenance strategy do you choose?

Where is the strategy assigned to the task list?

2. Create operations for the task list. How do you proceed if you want various operations to be executed at different intervals? Use all the packages in the strategy at least once.

Solution 9: Task List and Maintenance Strategy

Task:

In the task list group **PM-##**, create a new general maintenance task list and assign a maintenance strategy with which you can carry out key-date scheduling.

1. Which maintenance strategy do you choose?

Where is the strategy assigned to the task list?

- a) *SAP Menu → Logistics → Plant Maintenance → Preventive Maintenance → Work Scheduling → Task Lists → General Maintenance Task Lists → Create*

Task list group **PM-##**

Assign maintenance strategy **B** in the task list header.

2. Create operations for the task list. How do you proceed if you want various operations to be executed at different intervals? Use all the packages in the strategy at least once.

Answer: In the operation overview for the task list, select *Maint. packages* and activate the required packages for the respective operation.



Lesson Summary

You should now be able to:

- Assign the maintenance strategy to the task list
- Assign maintenance packages to operations

Lesson: Time-Based Strategy Plan

Lesson Overview

This lesson shows how to maintain a time-based maintenance plan with strategy.



Lesson Objectives

After completing this lesson, you will be able to:

- Create a time-based strategy plan

Business Example

The project team maintains the time-dependent strategy plans for the pumps identified.

Time-Based Strategy Plan

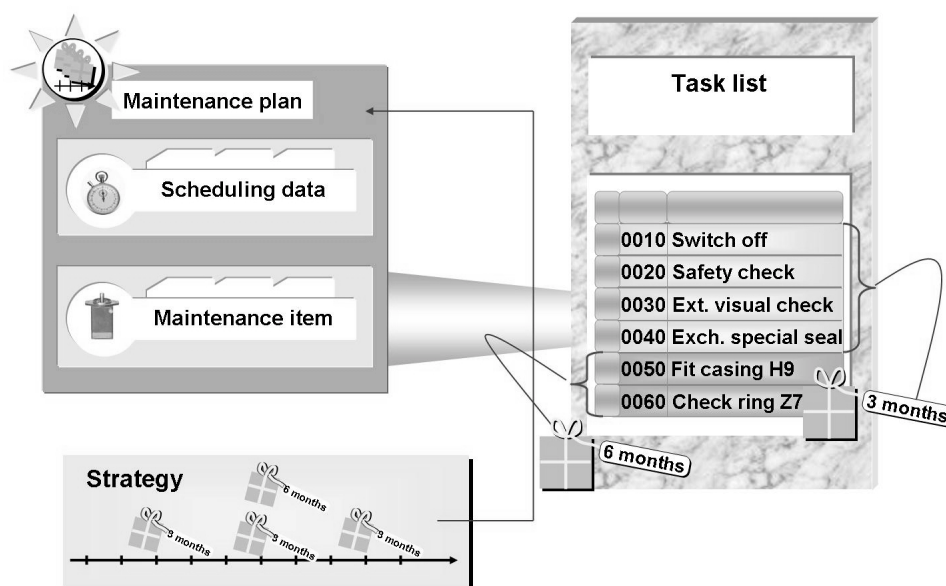


Figure 61: Creating a Time-Based Strategy Plan

When a **time-based strategy plan** is created, the corresponding **strategy** is assigned to the maintenance plan.

You can either select the required task list or enter it directly. When the selection is made, the maintenance strategy is already preset as a selection parameter, so that only task lists with the relevant strategy are selected. It is also possible to create a general maintenance task list from the maintenance plan (more exactly: from the maintenance item).

When you include the task list, the maintenance packages used are checked and displayed in the cycles for the maintenance plan. Only the maintenance packages used by the task list are displayed.



Lesson Summary

You should now be able to:

- Create a time-based strategy plan

Lesson: Strategy Plan Scheduling (Time-Based)

Lesson Overview

This lesson shows the scheduling of time-based maintenance plans with strategy.



Lesson Objectives

After completing this lesson, you will be able to:

- Schedule a time-based strategy plan

Business Example

The project team configures scheduling of maintenance plans and thus ensures that maintenance orders are called automatically.

Scheduling

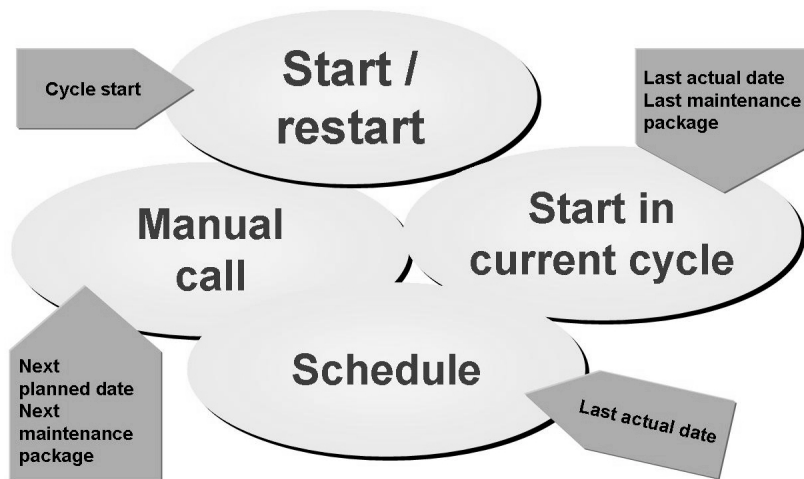


Figure 62: Scheduling Functions - Single Cycle Plan

The scheduling functions for the strategy plan are the same with one exception, namely, the single cycle plan.

Exception: **Start in cycle**

At the start of the cycle, it is possible to go directly into an existing process flow for preventive maintenance.

For example:

A strategy has a 1-month, 3-month and 12-month package. When the maintenance plan is created, preventive maintenance is already taking place in your company: Two weeks ago, the eighth 1-month package was executed. The start in the cycle enables the maintenance plan to start not with the first 1-month package, but with the ninth 1-month package due and the third 3-month package.

Factory calendar: For the strategy plan, the factory calendar for the strategy is copied into the scheduling parameters as a default value. It can be changed for each strategy plan.

Cycle start: Start date for calculating planned and call dates.

Call horizon: Determines when a maintenance call object (for example, a maintenance order) is generated for a waiting maintenance call.

Scheduling period: Determines the period of time, for which the system generates planned or call dates during scheduling.

Completion requirement: Determines that the next maintenance call object is generated when the previous call object has been completed.

Shift factors: The shift factors for the early/delayed confirmation of a maintenance task define the percentage of the shift that should be considered for the next date.

Tolerances for shift factors The tolerances for early/delayed confirmation define the time period, for which positive or negative differences between actual and planned dates do not affect subsequent scheduling.

Factory calendar: You can use your own calendar if necessary.

Cycle modification factor: You can use the cycle modification factor to change the cycle times for a maintenance strategy individually for each maintenance plan. A cycle modification factor greater than 1 extends the cycle times valid for the strategy, a factor less than 1 reduces them.

Scheduling indicator: Specifies the type of time-based scheduling involved:

- **Time (= based on calendar):** The dates are calculated in **calendar days**.
- **Time - key-date-based:** The dates are always calculated from the cycle start **for the respective key date**
- **Time: Using factory calendar:** The dates are calculated in **working days**.

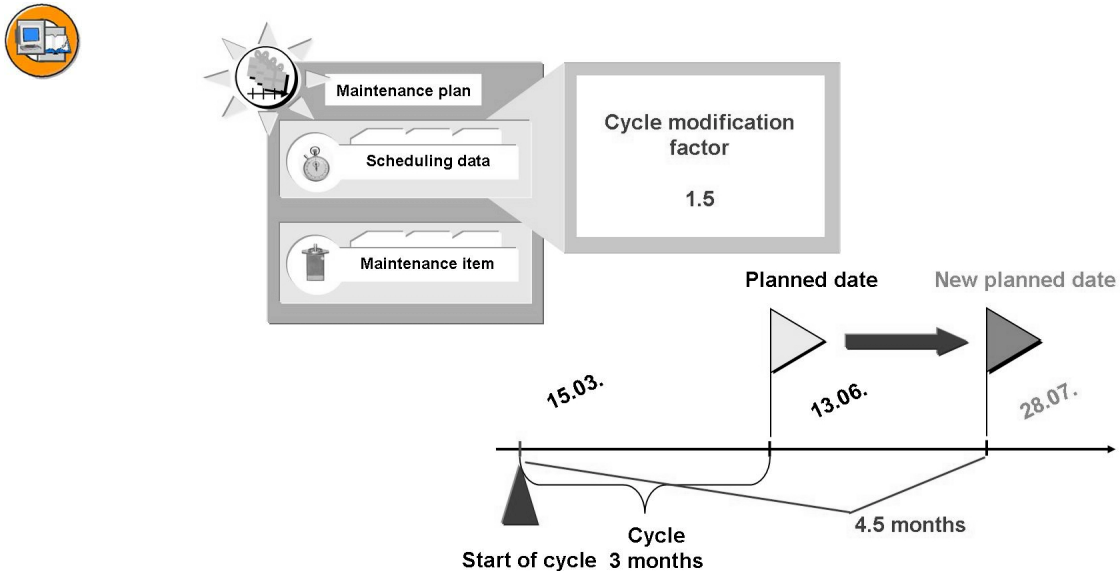


Figure 63: Cycle modification factor

The **cycle modification factor** is one of the **scheduling parameters** for the maintenance plan.

The **cycle modification factor** can be used to extend or shorten the maintenance cycle, for example, to react to temporary additional requirements without changing the maintenance strategy.

The cycle modification factor is only valid for the maintenance plan in which it has been defined.

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Exercise 10: Time-Based Strategy Plan

Exercise Objectives

After completing this exercise, you will be able to:

- Create a time-based strategy plan
- Schedule a time-based strategy plan

Business Example

The project team needs to create the maintenance plans for time-based and strategy-based maintenance planning

Task:

Display the *Scheduling by key date* maintenance strategy and check the maintenance packages.

1. Which values are set for the initial and subsequent buffers?

What impact do these values have on the order that is generated?

2. Create a time-based strategy plan for key-date scheduling for the piece of equipment **TEQ-##**, with the objective of incorporating the task list created in the last lesson.

Set the scheduling period to one year.

What must you take into account with regard to the maintenance strategy?

How do you do this?

Make a note of the maintenance plan number.

3. Start the maintenance plan in the cycle, so that the next due package is the yearly package and the last maintenance task was executed 8 days ago.

Continued on next page

How do you do this?

Which confirmation date have you entered?

Which package have you chosen?

Check the scheduled calls. Why is the first planned date waiting?

4. Release the first planned date manually because you want to start this work in advance. How do you do this?

5. Skip the second planned date because the work should not be carried out. How do you do this?

6. How can you ensure that the third planned date is carried out on a new date that you have defined?

Solution 10: Time-Based Strategy Plan

Task:

Display the *Scheduling by key date* maintenance strategy and check the maintenance packages.

- Which values are set for the initial and subsequent buffers?

What impact do these values have on the order that is generated?

- SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Strategies → Display*

Scheduling by key date (B):

Field name or data type	Values
1-monthly package	Initial buffer: 1 day Subsequent buffer: 1 day
3-monthly package	Initial buffer: 2 days Subsequent buffer: 2 days
12-monthly package	Initial buffer: 3 days Subsequent buffer: 3 days

An initial buffer or subsequent buffer of n days shifts the start/end dates for the order forwards or backwards with reference to the planned date.

- Create a time-based strategy plan for key-date scheduling for the piece of equipment **TEQ-##**, with the objective of incorporating the task list created in the last lesson.

Set the scheduling period to one year.

What must you take into account with regard to the maintenance strategy?

Continued on next page

How do you do this?

Make a note of the maintenance plan number.

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Strategy Plan*

Field name or data type	Values
Maintenance plan category	PM Maintenance Order
Strategy	B
Scheduling period	Yearly

The maintenance strategy for the task list must correspond with that of the maintenance plan.

On the maintenance item screen, in the Task list section: Enter *A* as the maintenance plan category, task list group, and group counter, or choose *Select task list* and enter the corresponding selection criteria.

3. Start the maintenance plan in the cycle, so that the next due package is the yearly package and the last maintenance task was executed 8 days ago.

How do you do this?

Which confirmation date have you entered?

Which package have you chosen?

Check the scheduled calls. Why is the first planned date waiting?

Continued on next page

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule*

Select *Start in cycle*

Field name or data type	Values
Completion date	Today's date – 8 days
Select package button	Choose <i>Select package</i> Select eleventh 1-monthly package Select <i>Set start offset</i> Select <i>Back</i>

The first call is waiting, because there is a call horizon of 90%, set by key date scheduling (strategy B).

4. Release the first planned date manually because you want to start this work in advance. How do you do this?

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule*

Select the line with the planned date and choose *Release call* (green flag icon).

5. Skip the second planned date because the work should not be carried out. How do you do this?

Continued on next page

-
- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule*

Select the second planned date and *Skip call*

6. How can you ensure that the third planned date is carried out on a new date that you have defined?

-
-
- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule*

Select the third planned date and *Fix call*.



Lesson Summary

You should now be able to:

- Schedule a time-based strategy plan



Unit Summary

You should now be able to:

- Describe the structure and functions of a maintenance strategy
- Assign the maintenance strategy to the task list
- Assign maintenance packages to operations
- Create a time-based strategy plan
- Schedule a time-based strategy plan

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Unit 5

Maintenance Planning with Strategy: Performance-Based

Unit Overview

This unit introduces maintenance planning with strategy (performance-based) and explains detailed functions and the required Customizing settings.



Unit Objectives

After completing this unit, you will be able to:

- Describe the functions of measuring points and counters
- Create and maintain a counter for a technical object
- Create a performance-based maintenance plan
- Schedule a performance-based maintenance plan
- Describe the enhancement options provided by customer exits

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Lesson: Counters and Measurement Documents

Lesson Overview

This lesson shows how counters are maintained for technical objects as the basis for performance-based maintenance planning.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the functions of measuring points and counters
- Create and maintain a counter for a technical object

Business Example

Some machines in the company are to be maintained on the basis of their running performance. Counters must be defined for this for the object in question.

Counters and Measurement Documents

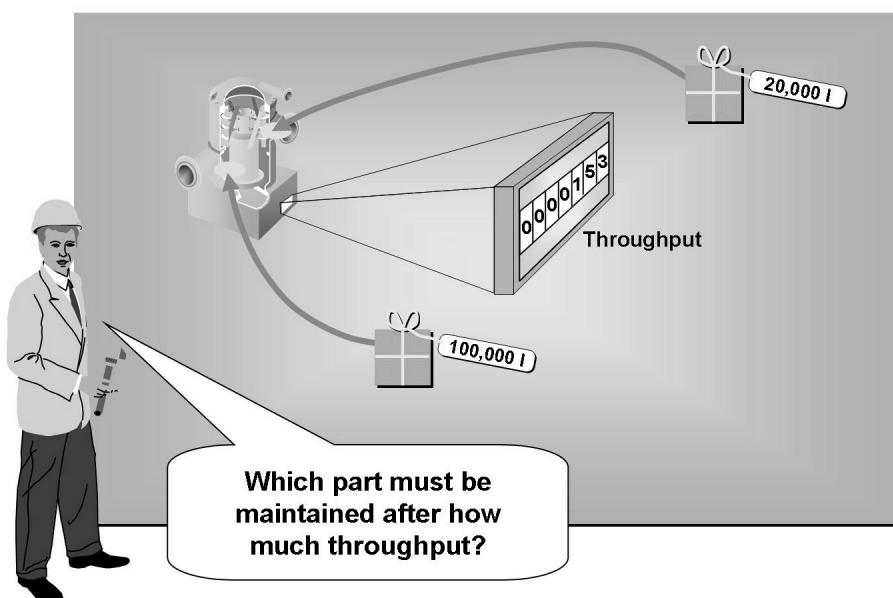


Figure 64: Performance-based maintenance planning business process

For example:

Different maintenance tasks should be performed on the pumps at your company based on their throughput. For example, a safety check should be performed after 20,000 litres and all the seals changed after 100,000 liters.

Preventive maintenance can be planned and performed using a performance-based strategy and regularly entered counter readings. The maintenance dates calculated are adjusted automatically based on the counter readings entered.

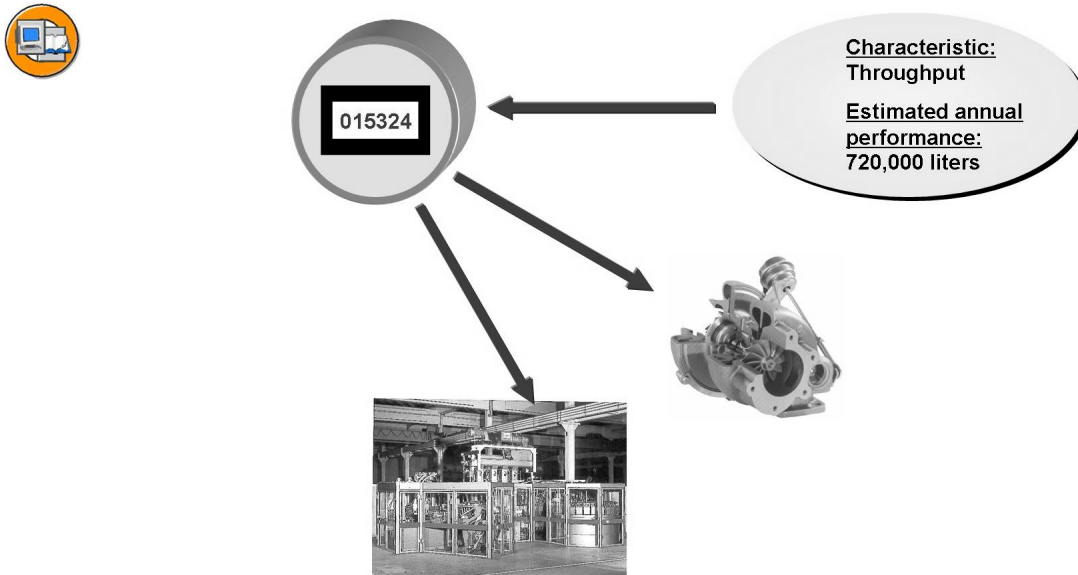


Figure 65: Creating a Counter

Counters are represented in the SAP System as a special form of **measuring points**. Measuring points are always created with reference to the object (for example, equipment), but obtain their own master record in the system.

A **characteristic** (for example, operating hours, flow and so on) is assigned to the counter (from the classification system). The characteristic is always used linked with the respective **characteristic unit** (for example, hours, liters).

The **estimated annual performance** is part of the counter and is entered as a fixed value. It forms the basis for calculating the maintenance intervals.

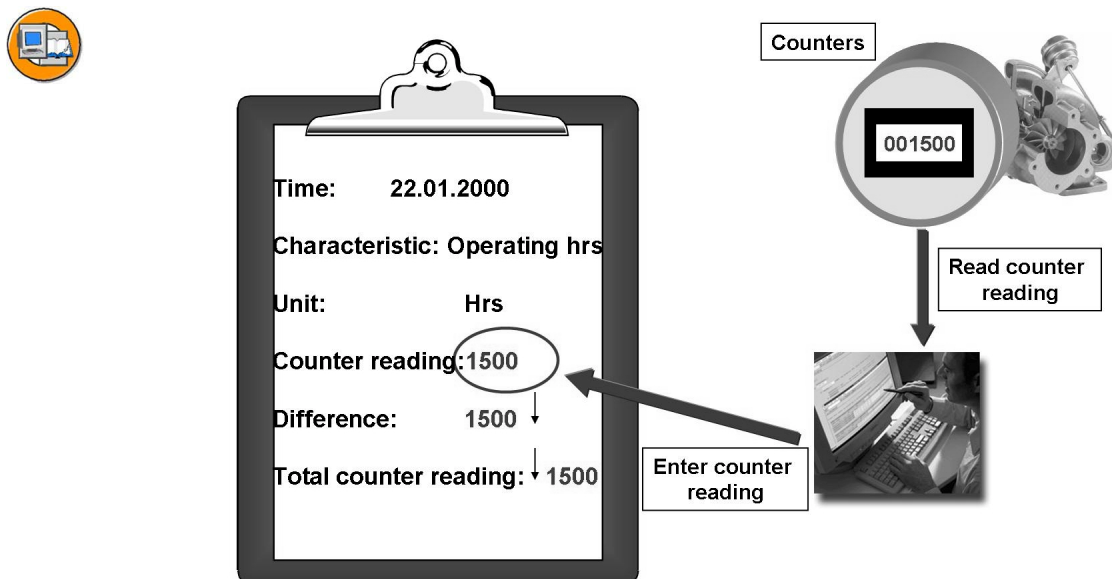


Figure 66: Creating an Initial Measurement Document

The initial measurement document is the first measurement document that is entered for a newly added counter. It represents the current counter reading at this time.

If no initial measurement document is created for the new counter, a maintenance plan, which uses this counter, cannot be started.

Performance-based maintenance planning is based on measurement documents that should be entered as often as possible to represent the service process as accurately as possible.

Exercise 11: Counters and Measurement Documents

Exercise Objectives

After completing this exercise, you will be able to:

- Create a counter for a technical object
- Create a measurement document

Business Example

In the company, performance-based (counter-based) maintenance is carried out in some areas. For example, the pumps used in the pump station for biological cleaning are maintained based on flow in liters.

Task:

Create a flow counter with an annual performance of **36,500** liters for the piece of equipment **TEQ-##**.

1. Which characteristic do you use?

2. Create the initial measurement document with 0 liters. How do you do this?

Solution 11: Counters and Measurement Documents

Task:

Create a flow counter with an annual performance of **36,500** liters for the piece of equipment **TEQ-##**.

1. Which characteristic do you use?

- a) *SAP Menu* → *Logistics* → *Plant Maintenance* → *Management of Technical Objects* → *Equipment* → *Change*

Select *Measuring points/counters*, and then *New entries*

Field Name or Data Type	Values
Measuring point (number)	Assigned automatically
Characteristic	FLOW IN LITERS
Counter indicator	X
Description of measuring point	For example, flow in liters counter

Select a new measuring point and choose *Measuring point* (in the detail view of the measuring point).

Field Name or Data Type	Values
Counter overflow mark	For example, 1,000,000
Annual performance	36.500

2. Create the initial measurement document with 0 liters. How do you do this?

Continued on next page

-
- a) *SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Measurement Documents → Create*

Field Name or Data Type	Values
Measuring point	See above
Counter reading	0



Lesson Summary

You should now be able to:

- Describe the functions of measuring points and counters
- Create and maintain a counter for a technical object

Lesson: Performance-Based Maintenance Plan

Lesson Overview

This lesson shows how performance-based maintenance plans are maintained.



Lesson Objectives

After completing this lesson, you will be able to:

- Create a performance-based maintenance plan

Business Example

The project team creates performance-based maintenance plans for the relevant machines.

Performance-Based Maintenance Plan

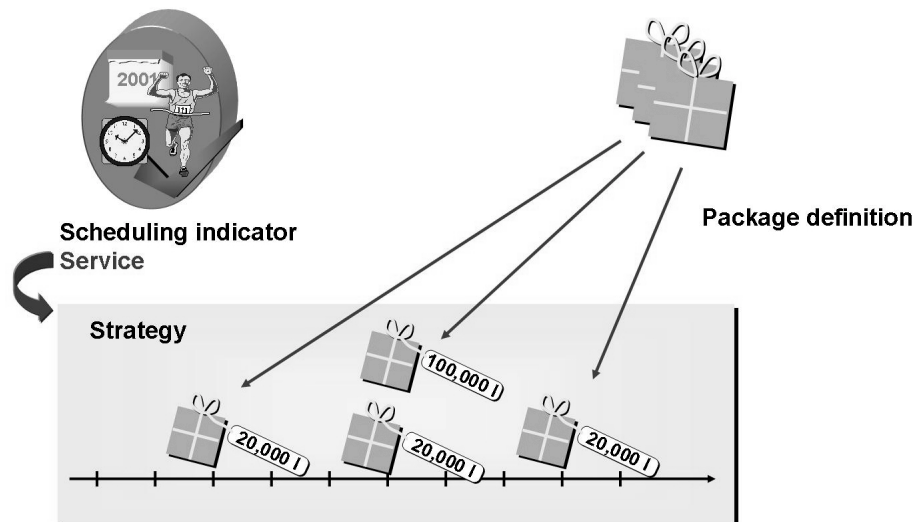


Figure 67: Performance-Based Maintenance Strategy

Performance-based maintenance - Example:

Specific maintenance work should be carried out on a pump after 20,000, 100,000 and 150,000 liters of throughput.

For performance-based maintenance, a strategy is defined with the *Performance* scheduling indicator (activity).

A strategy unit is assigned (for example, liters - for maintenance based on the volume of throughput).

In the strategy, maintenance packages are defined that use the same parameters as in time-based maintenance. For example, a specific throughput quantity is entered as cycle length (for example, 20,000 liters).

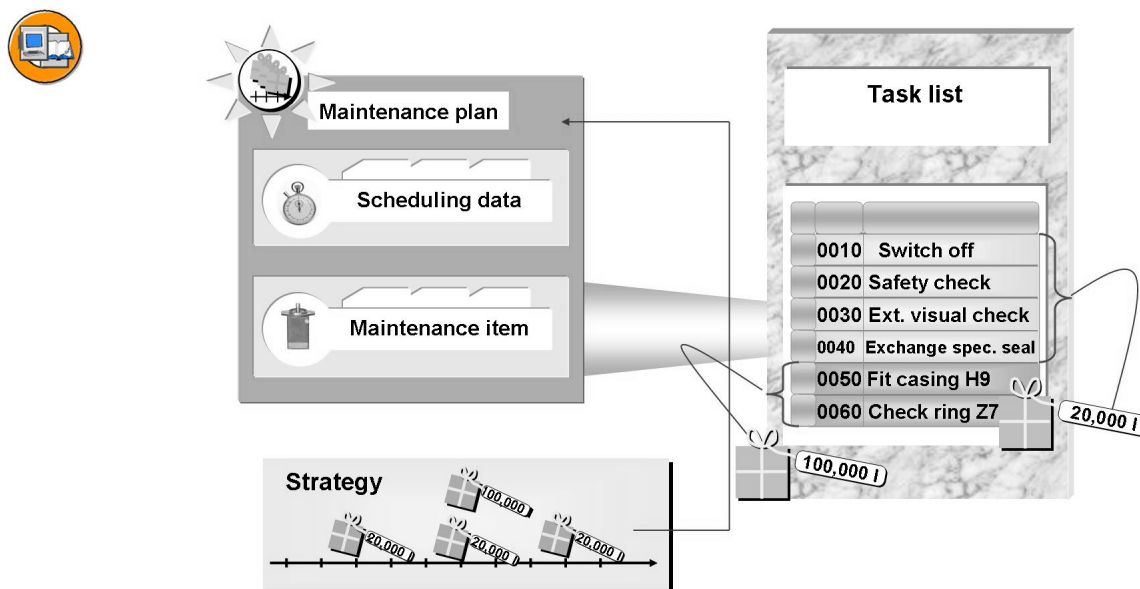


Figure 68: Creating a Performance-Based Strategy Plan

The performance-based maintenance plan can be created as a single cycle plan or strategy plan.

To create a performance-based maintenance plan, a counter must be available for the reference object of the maintenance item.

When the plan is created, questions must be answered about the category of maintenance plan and maintenance strategy (analogous to creating a time-based maintenance plan).

When the reference object is entered, the counter is proposed automatically, depending on the unit for the maintenance strategy (for example, liters). For the performance-based single cycle plan, the counter is proposed automatically after the maintenance cycle and reference object have been entered.

You can either select the required task list or enter it directly. When the selection is made, the maintenance strategy is already preset as a selection parameter, so that only task lists with the relevant strategy are selected. It is also possible to create a general maintenance task list from the maintenance plan (more exactly: from the maintenance item).

When you include the task list, the maintenance packages used are checked and displayed in the cycles for the maintenance plan. Only the maintenance packages used by the task list are displayed.

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Exercise 12: Performance-Based Maintenance Plan

Exercise Objectives

After completing this exercise, you will be able to:

- Create a performance-based maintenance plan

Business Example

For performance-based maintenance planning, the relevant maintenance plans must first be created

Task:

Create a general maintenance task list with maintenance strategy **DFL** and three operations.

1. Use the following data:

Group	PM-##
Profile	0000001
Planning plant	1000
Work center	T-ME##
Use	4
Status	4
Maintenance Strategy	DFL

Which packages are defined in the maintenance strategy?

Link the operations to a package. When doing this, use all the packages in the strategy. How do you do this?

Continued on next page

2. For the piece of equipment **TEQ-##**, create a maintenance plan for performance-based maintenance using the strategy **DFL** and incorporate the general task list created earlier into the maintenance plan.

How do you do this?

Make a note of the maintenance plan number.

Solution 12: Performance-Based Maintenance Plan

Task:

Create a general maintenance task list with maintenance strategy **DFL** and three operations.

1. Use the following data:

Group	PM-##
Profile	0000001
Planning plant	1000
Work center	T-ME##
Use	4
Status	4
Maintenance Strategy	DFL

Which packages are defined in the maintenance strategy?

Link the operations to a package. When doing this, use all the packages in the strategy. How do you do this?

Continued on next page

- a) *SAP menu* → *Logistics* → *Plant Maintenance* → *Preventive Maintenance* → *Maintenance Planning* → *Work Scheduling* → *General Maintenance Task Lists* → *Create*

Field name or data type	Values
Group	PM-##
Profile	0000001

Select *New entries*.

Field name or data type	Values
Task list group counter	2 (assigned automatically)
Description	For example, maintenance according to flow in liters
Work center	T-ME##
Use	4
Status	4
Maintenance Strategy	DFL

Maintenance packages

Field name or data type	Values
Package 1	Every 10,000 liters
Package 2	Every 50,000 liters
Package 3	Every 100,000 liters

Assign maintenance packages:

Choose *Maint. packages* and select packages for the respective operation.

- For the piece of equipment **TEQ-##**, create a maintenance plan for performance-based maintenance using the strategy **DFL** and incorporate the general task list created earlier into the maintenance plan.

How do you do this?

Make a note of the maintenance plan number.

Continued on next page

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Strategy Plan*

Field name or data type	Values
Maintenance plan	Leave blank
Maintenance plan category	Plant maintenance
Maintenance Strategy	DFL
Reference object	TEQ-##
Counter	Determined automatically from reference object
Task list - Type	A
TaskLstGrp	PM-##
Task list - GrpCr	2



Hint: When you save the performance-based strategy plan, the current counter reading is automatically set as the default initial counter reading.

You can confirm this to copy it to the maintenance plan.



Lesson Summary

You should now be able to:

- Create a performance-based maintenance plan

Lesson: Maintenance Plan Scheduling (Performance-Based)

Lesson Overview

This lesson shows the scheduling of performance-based maintenance plans.



Lesson Objectives

After completing this lesson, you will be able to:

- Schedule a performance-based maintenance plan

Business Example

Scheduling of performance-based maintenance plans must be configured so that the right maintenance date is calculated to match the actual running performance.

Scheduling

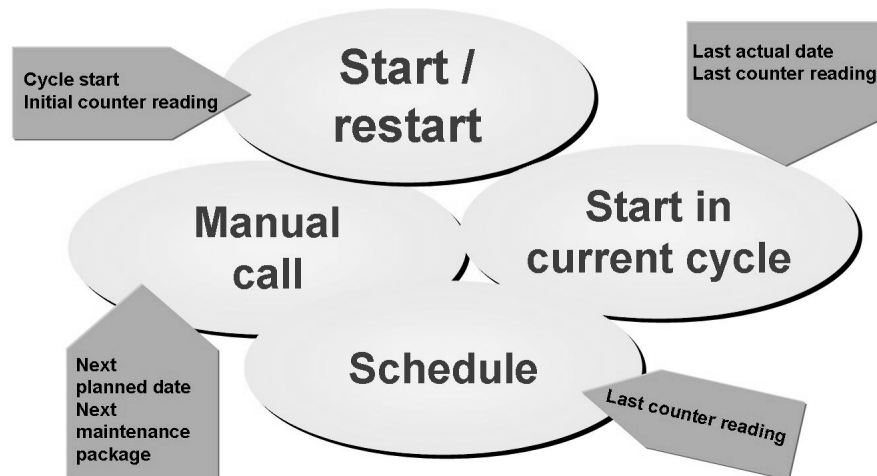


Figure 69: Scheduling Functions

The scheduling functions for the performance-based strategy plan are the same with one exception, namely, the single cycle plan.

Start in cycle

At the start of the cycle, it is possible to go directly into an existing process flow for preventive maintenance (see time-based strategy plan).



Hint: When you start the performance-based maintenance plan, a smaller counter reading than that of the last measurement document can be entered. The reason for this is that by entering a smaller counter reading, a type of start in the cycle is achieved, that is, the first date can come earlier for the same cycle.

However, you cannot enter a larger counter reading than that of the last measurement document, since maintenance planning should be structured based on current data documented in the system using measurement documents.

Scheduling Parameters - Performance-Based:

- Call horizon
- Scheduling period
- Initial counter reading
- Completion requirement
- Shift factors
- Tolerances for shift factors
- Cycle modification factor

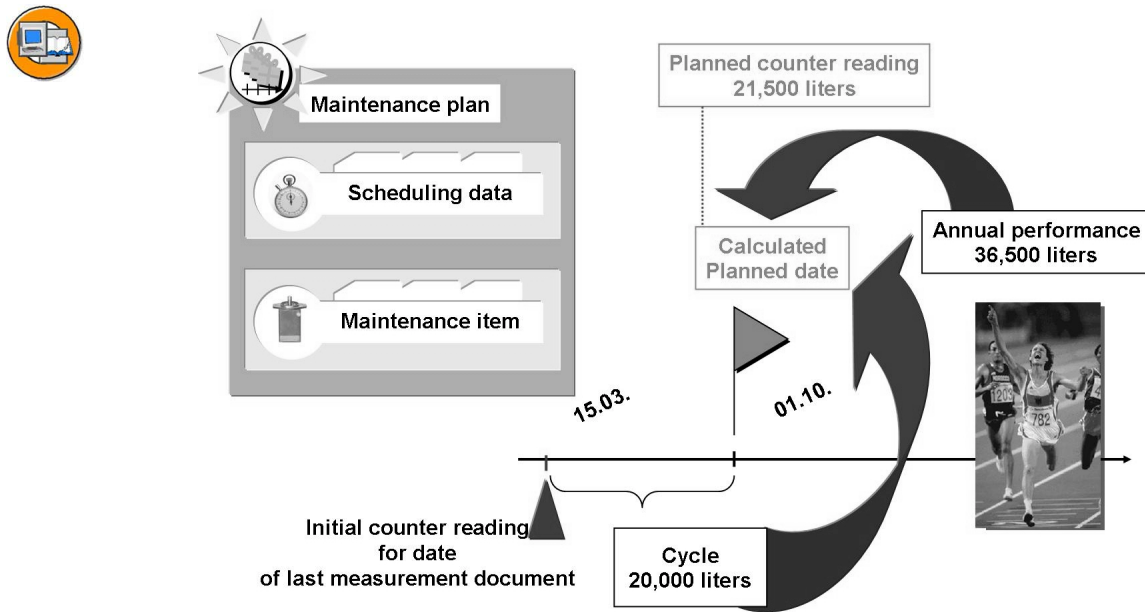


Figure 70: Basic Scheduling Functions

The scheduling of performance-based maintenance plans is based on the **estimated annual performance** entered in the reference object counter.

The **daily performance** is then calculated from the estimated annual performance.

A time period is then calculated from the daily performance and maintenance cycle. By adding this time period to the start date of the maintenance plan, a new **planned date** is determined.

At the same time, a new **planned counter reading** is calculated by adding the cycle value to the current counter reading.

For example:

Estimated annual performance:	36,500 liters
Internal calculation of daily performance:	$36.500 : 365 \text{ days} = 100 \text{ liters per day}$
Planned date for a cycle of 20,000 liters:	$20.000 : 100 = 200 \text{ days}$

This means that, beginning from the cycle start, the first planned date is set after 200 days.

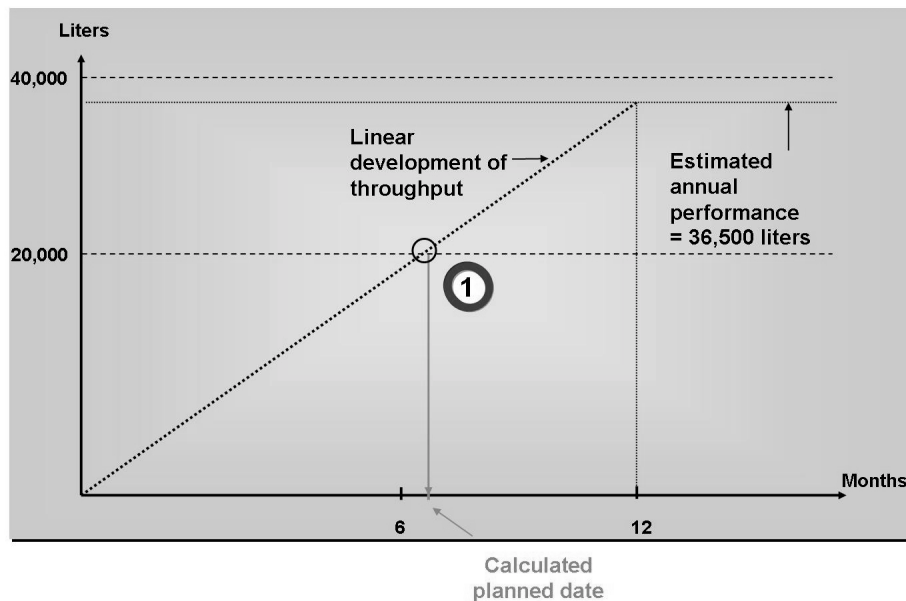


Figure 71: Scheduling Functions (1)

1.) A planned date is calculated based on the estimated annual performance, depending on the cycle.

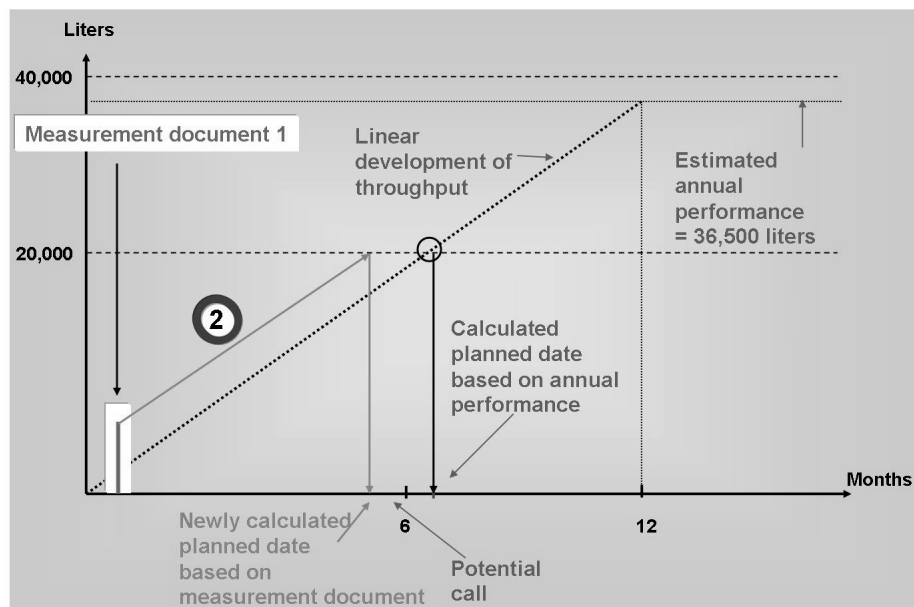


Figure 72: Scheduling Functions (2)

2.) If a measurement document is entered, the planned date is thereby recalculated. In other words, the planned dates are controlled directly by the measurement documents entered.

This means to obtain a planned date which exactly reflects the performance throughput, measurement documents must be **regularly** entered.

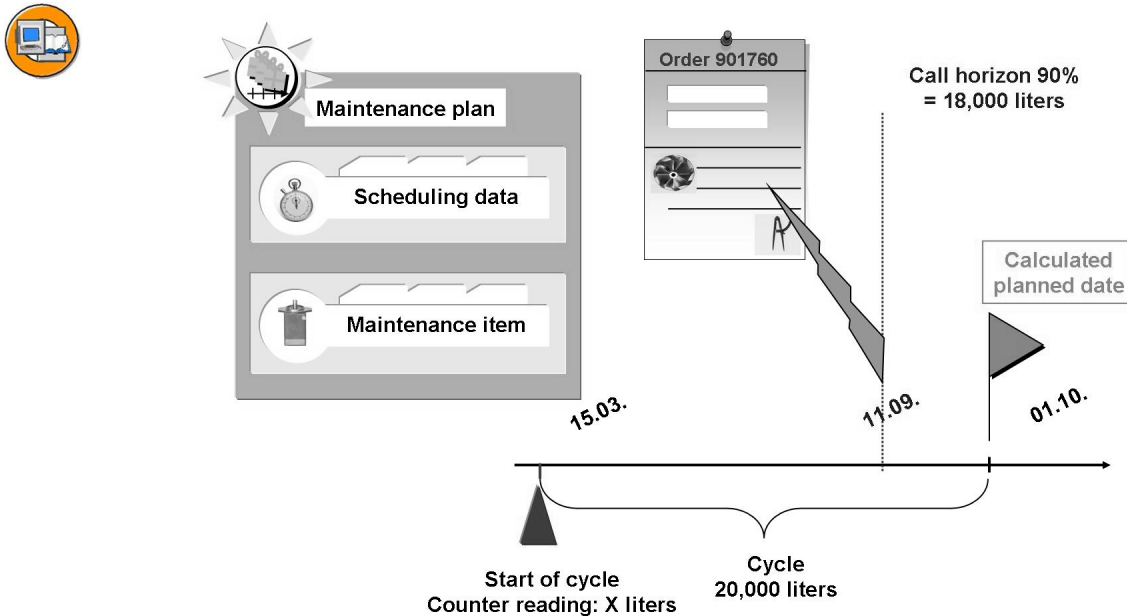


Figure 73: Call horizon

The call horizon is specified as a percentage and refers to the duration of the cycle. It specifies when an order should be generated, with reference to a calculated maintenance date.

For example:

- Annual throughput: 36,500 liters
- Results in a daily throughput quantity of 100 liters
- Selected cycle: 20,000 liters
- Results in a calculated cycle duration of 200 days
- Cycle start is a counter reading of 0 liters on 03/15
- Results in a planned date on 10/01
- Call horizon should be 90%

meaning that the order is not created on 10/01 but on 9/11 (therefore, after 180 days).



Caution: The above example is a calculation of planned dates that does not take account of measurement documents. If measurement documents are created, the planned dates are recalculated based on these measurement documents (see next page).



Hint: If no value is specified for the call horizon when scheduling the maintenance plan, the system assumes that the call horizon is 0%. As a result, a call is made immediately (that is, an order is generated) when the maintenance plan is started, independent of the counter reading. If the cycle duration should be kept, it is advisable to set a call horizon of 100%.

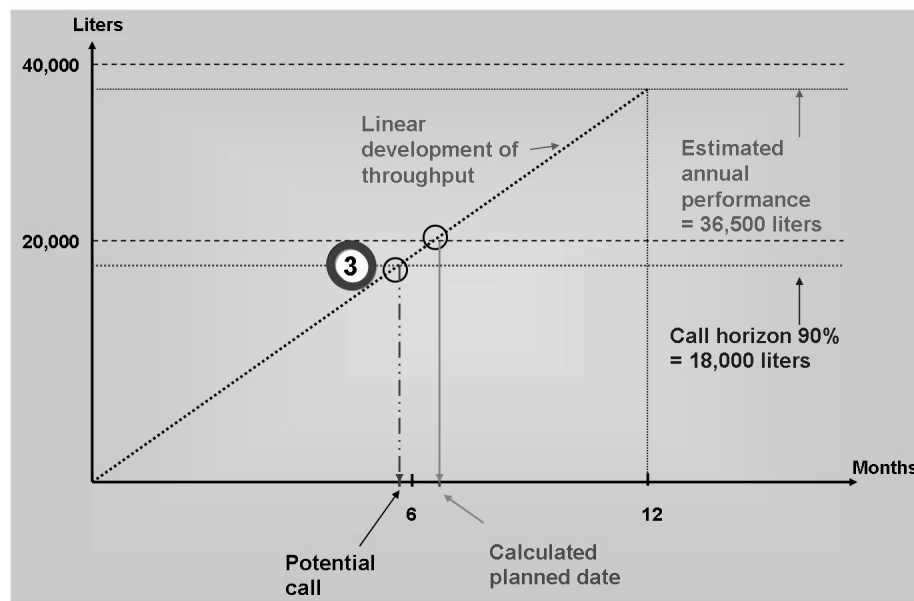


Figure 74: Scheduling Functions (3)

3.) If you are working with a call horizon of 90%, for example, the calculated planned date also appears in the list of scheduled calls.

However, the call (when the order is generated) occurs earlier:

For example:

Cycle start:	15.03.
Estimated annual performance:	36,500 liters
Calculated daily performance:	100 liters
Resulting planned date:	01.10.

Call horizon: 90%

Call date: after 180 days, therefore 09/10

This means that an order would be generated on **10/09**, if no measurement documents were to be entered before then.

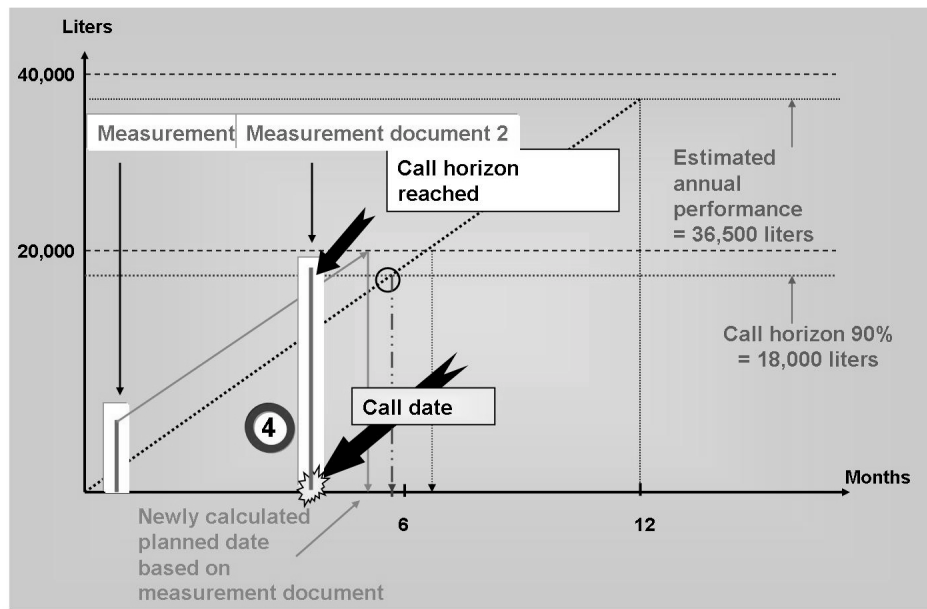


Figure 75: Scheduling Functions (4)

4.) If a measurement document is entered, which reaches or exceeds the **call horizon**, the call is carried out. In other words, the order (or notification or service entry sheet) is generated.

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Exercise 13: Maintenance Plan Scheduling (Performance-Based)

Exercise Objectives

After completing this exercise, you will be able to:

- Schedule a performance-based maintenance plan

Business Example

The project configures the scheduling of performance-based maintenance plans on the basis of the measurement documents, in order to ensure that the maintenance order is called as soon as possible after the defined running performance value has been reached.

Task:

Check the scheduling parameters of the maintenance plan you created earlier.

1. Which values are set for shift factors, call horizon and scheduling period? Where do these values originate?

2. Start the maintenance plan and enter the initial counter reading entered previously. How do you do this?

What is the calculated planned date?

What is the call date?

3. Enter a new counter reading that is more than 10,000 liters. Which menu path do you use?

Continued on next page

-
4. Call the deadline monitoring function, enter the maintenance plan number and execute.

How have the scheduled calls changed?

Which order number does the system assign?

5. Check the maintenance order generated above, release it if necessary, and technically complete it immediately.

How do you make the selection?

How have the scheduled calls in the maintenance plan changed?

6. How do you lock a maintenance plan for scheduling?
-

7. Display the scheduling overview as a list for all performance-based strategy plans created during the training course period. How do you do this?
-

8. Display the same maintenance plans in the graphical scheduling overview. Simulate the scheduled calls for the next six months. What must you take into account?
-

Solution 13: Maintenance Plan Scheduling (Performance-Based)

Task:

Check the scheduling parameters of the maintenance plan you created earlier.

- Which values are set for shift factors, call horizon and scheduling period? Where do these values originate?

- SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Display*

Field name or data type	Values
Shift factor for late completion	100 %
Shift factor for early completion	100 %
Call horizon	90 %
Scheduling period	0 days

The scheduling parameters are proposed by the strategy **DFL** and can be changed in the maintenance plan.

- Start the maintenance plan and enter the initial counter reading entered previously. How do you do this?

What is the calculated planned date?

What is the call date?

Continued on next page

a) *Scheduling for Maintenance Plans → Schedule**or**SAP menu → Logistics → Plant Maintenance → Preventive Maintenance
→ Maintenance Planning → Scheduling for Maintenance Plans →
Schedule**Edit → Start*

Current counter reading is proposed; confirm

Planned date / call date:

Field name or data type	Values
Planned date	Today's date + 100 days^
Call date	Today's date +90 days^

3. Enter a new counter reading that is more than 10,000 liters. Which menu path do you use?

a) *SAP menu → Logistics → Plant Maintenance → Management of
Technical Objects → Equipment → Measurement Documents → Create*

Field name or data type	Values
Counter reading	For example, 10,500

4. Call the deadline monitoring function, enter the maintenance plan number and execute.

How have the scheduled calls changed?

Which order number does the system assign?

Continued on next page

-
- a) ***SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Deadline Monitoring***

When the planned counter reading (10,000 liters) is reached or exceeded, the planned date is converted into a call, that is, an order is generated.

A new planned date is also attached. This data is calculated as follows:

(Next planned counter reading – current counter reading) / daily performance = position for next planned date, for example:

(20,000 liters – 10,500 liters) / 100 days = 95 days

5. Check the maintenance order generated above, release it if necessary, and technically complete it immediately.

How do you make the selection?

How have the scheduled calls in the maintenance plan changed?

- a) ***SAP Menu → Logistics → Plant Maintenance → Maintenance Processing → Order → Order List → Change***

Selection criteria: Status *Outstanding* and Status *In process*, maintenance plan number

Choose *Release order* (if necessary), then *Complete (Technically)*

After the order has been technically completed, the corresponding call is marked as completed in the maintenance plan. The date of the technical completion is entered as the completion date.

6. How do you lock a maintenance plan for scheduling?

Continued on next page

-
- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Change*

Maintenance plan → Functions → Active <-> Inactive → Deactivate

7. Display the scheduling overview as a list for all performance-based strategy plans created during the training course period. How do you do this?
-
-

-
- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Scheduling Overview → List*

Selection criteria:

Field name or data type	Values
Created by	PLM310-00 to PLM310-18
Created on	Enter the course date
Strategy	DFL

8. Display the same maintenance plans in the graphical scheduling overview. Simulate the scheduled calls for the next six months. What must you take into account?
-
-

Continued on next page

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Scheduling Overview and Simulation*

Field name or data type	Values
Created by	PLM310-00 to PLM310-18
Created on	Enter the course date
Strategy	DFL
To date	Today's date from + 6 months
Parameter <i>With further dates</i>	X
Start mode for maintenance scheduling overview	Maintenance plan simulation



Lesson Summary

You should now be able to:

- Schedule a performance-based maintenance plan

Lesson: Customer Exits

Lesson Overview

This lesson demonstrates the enhancement options that customers can use for maintenance planning by using customer exits.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the enhancement options provided by customer exits

Business Example

Lessons Performance-Based Maintenance Plan + Scheduling.

Customer Exits

Preventive Maintenance

- IPRM0002
- IPRM0003
- IPRM0004
- IPRM0005

In the case of strong seasonal variances (for example, in agriculture), calculation of planned dates can be structured using the customer exit **IPRM0002** according to your own specifications. The planned date calculated by the system is hereby modified.

User-defined fields in the maintenance item can be defined using the customer exit **IPRM0003**.

You can use customer exit **IPRM0004** to perform checks (for example, to ensure that certain fields are always filled out) when saving the maintenance plan (or maintenance item).

In performance-based strategy plans, you can use customer exit **IPRM0005** to determine (according to your own rules) which maintenance packages will next fall due, dependent upon the previous counter reading.



Lesson Summary

You should now be able to:

- Describe the enhancement options provided by customer exits



Unit Summary

You should now be able to:

- Describe the functions of measuring points and counters
- Create and maintain a counter for a technical object
- Create a performance-based maintenance plan
- Schedule a performance-based maintenance plan
- Describe the enhancement options provided by customer exits

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Unit 6

Maintenance Planning with Cycles of Different Dimensions

Unit Overview

This unit introduces maintenance planning with cycles of different dimensions (performance-based and time-based) and explains detailed functions and the required Customizing settings.



Unit Objectives

After completing this unit, you will be able to:

- Describe the functions of the multiple counter plan
- Create a multiple counter plan
- Schedule a multiple counter plan

Unit Contents

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Exercise 14: Multiple Counter Plan	199

Lesson: Multiple Counter Plan

Lesson Overview

This lesson demonstrates maintenance planning with cycles of different dimensions.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the functions of the multiple counter plan
- Create a multiple counter plan

Business Example

The project team has identified a few objects in the company that are to be maintained on both a time and performance basis. Multiple counter plans need to be created for this.

Multiple Counter Plan

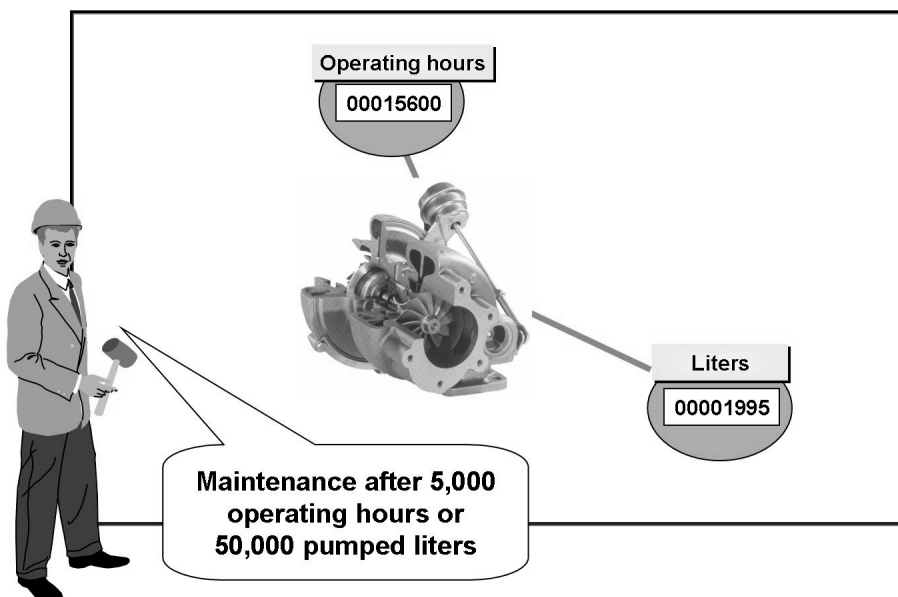


Figure 76: Business process: Maintenance Planning with Cycles of Different Dimensions

In a clarification plant, the water pumps are to be maintained on the basis of the following criteria:

- Number of operating hours
- Quantity of pumped liquid

To plan and carry out maintenance measures for this, you can use a **multiple counter plan** in which the two characteristics *operating hours* and *liters/flow in liters* are linked.

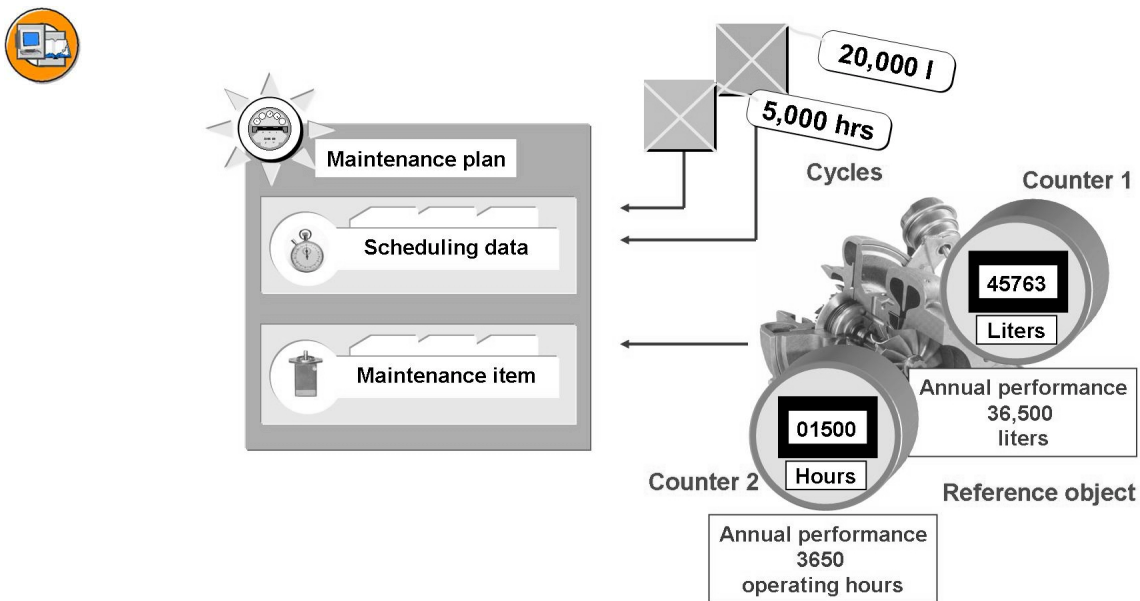


Figure 77: Multiple Counter Plan - Structure I

A multiple counter plan is a maintenance plan that can have cycles with different dimensions. You can assign cycles freely to the multiple counter plan. A strategy cannot be used here.

Based on the the cycles entered, the counters from the reference object are proposed by comparing the units.

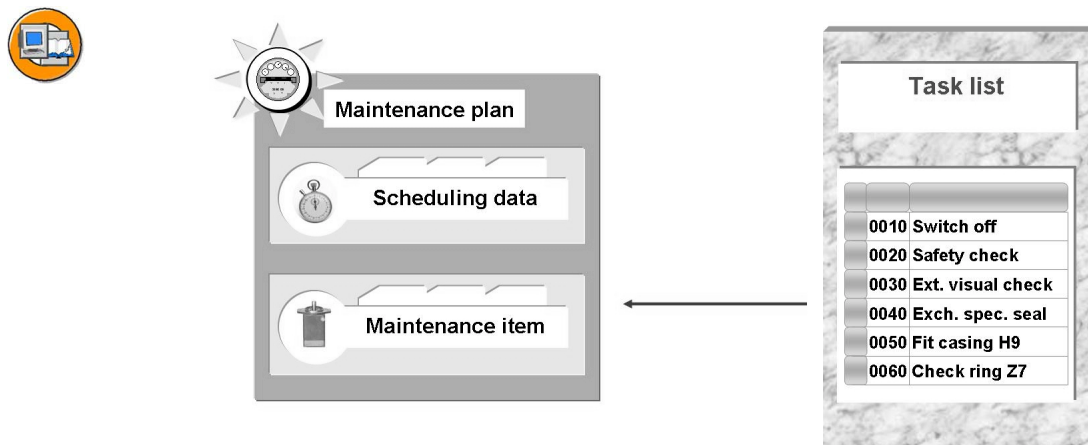


Figure 78: Multiple Counter Plan - Structure II

If a maintenance strategy is assigned to a task list, this has no influence during incorporation in a multiple counter plan. As a result, no operations are selected on the basis of assigned maintenance packages.

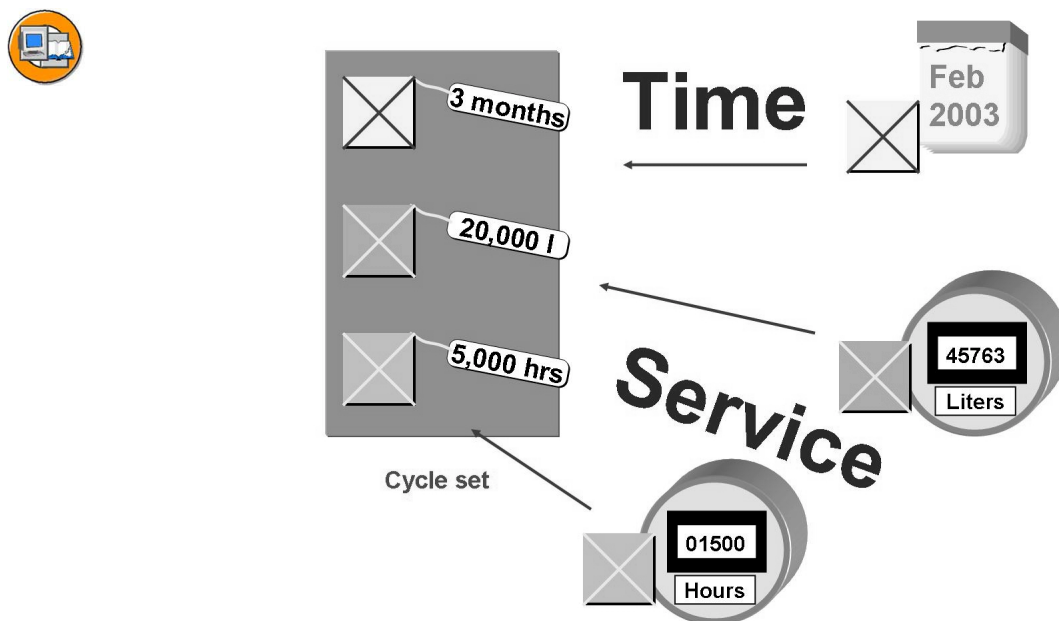


Figure 79: Cycle set

You use the cycle set as a template for creating a multiple counter plan. It consists of a series of maintenance cycles. In contrast to the maintenance strategy, the cycle set does not have a reference function. This means that after the maintenance plan has been created, there is no longer a link between the cycle set and the maintenance plan.

A maximum of one time-based cycle can be used in a multiple counter plan.

Once the cycle set has been included in the maintenance plan, the individual cycles can be changed or deleted.

Several cycle sets can also be included in a multiple counter plan. A sequence number (*cycle set sequence*) is then assigned to each cycle set.

This sequence number can be used to assign the cycle set to a maintenance item. It is therefore possible to have several maintenance items with different cycles.

For example: Car maintenance

The vehicle is to undergo a small inspection after 15,000 kilometers and/or one year. After another 15,000 kilometers and/or two years, a major inspection is to be carried out.

In a multiple counter plan, you can define two cycle sets for this with the cycles stated. You assign each cycle set (for example cycle set 1 and cycle set 2) to a maintenance item. One maintenance item contains the small inspection, the other the major inspection. Scheduling processing:

1. Scheduling considers cycle set 1 when calculating the first date, and only generates a call object for this date for the maintenance item assigned to cycle set 1.
2. Based on this date, scheduling considers the cycles of cycle set 2 to determine the next planned date, and again only generates a call object for the relevant maintenance item.
3. Once the second and thus highest cycle set has been scheduled, scheduling then considers the first cycle set again.



Hint: You can use the repeat factor to define how often a cycle set is used in a sequence to calculate a date before the system switches to the next cycle set.



Lesson Summary

You should now be able to:

- Describe the functions of the multiple counter plan
- Create a multiple counter plan

Lesson: Scheduling of Multiple Counter Plan

Lesson Overview

This lesson shows the scheduling of multiple counter plans.



Lesson Objectives

After completing this lesson, you will be able to:

- Schedule a multiple counter plan

Business Example

The project team makes ensures the optimum settings for scheduling multiple counter plans.

Scheduling

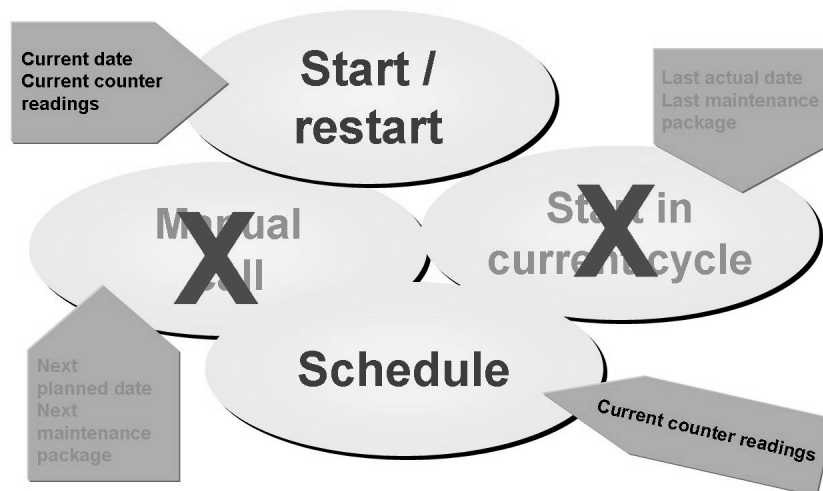


Figure 80: Scheduling Functions

The multiple counter plan is started based on the current counter readings.

The determining factor here is the date of the measurement document in which the last counter reading was recorded.

Scheduling is always updated based on the current counter readings.

A restart is possible.

The functions *Start in current cycle* and *Manual call* are not used for multiple counter plans.

The multiple counter plan recognizes the following **scheduling parameters**:

- **Cycle modification factor**
How the cycle modification factor lengthens or shortens the maintenance cycle in the strategy plan.
- **Preliminary buffer**
Defines the call date for the order in relation to the calculated planned date and thereby also the basic start date for the maintenance order.
It is specified in days.
- **Operation type**
Determines the type of link for the maintenance cycles. If the **AND** link is used, the order is only created when all the cycles are due. For an **OR** link, the order is created as soon as one of the cycles is due.
- **Start date/start time**
Defines the start date for automatic starting of the maintenance plan using deadline monitoring.
- **Scheduling period**
Defines the period for which the system calculates in advance planned dates/calls, which can then be displayed in a scheduling overview.
- **Completion requirement**
Defines that the current call object must be completed before a new one is generated.

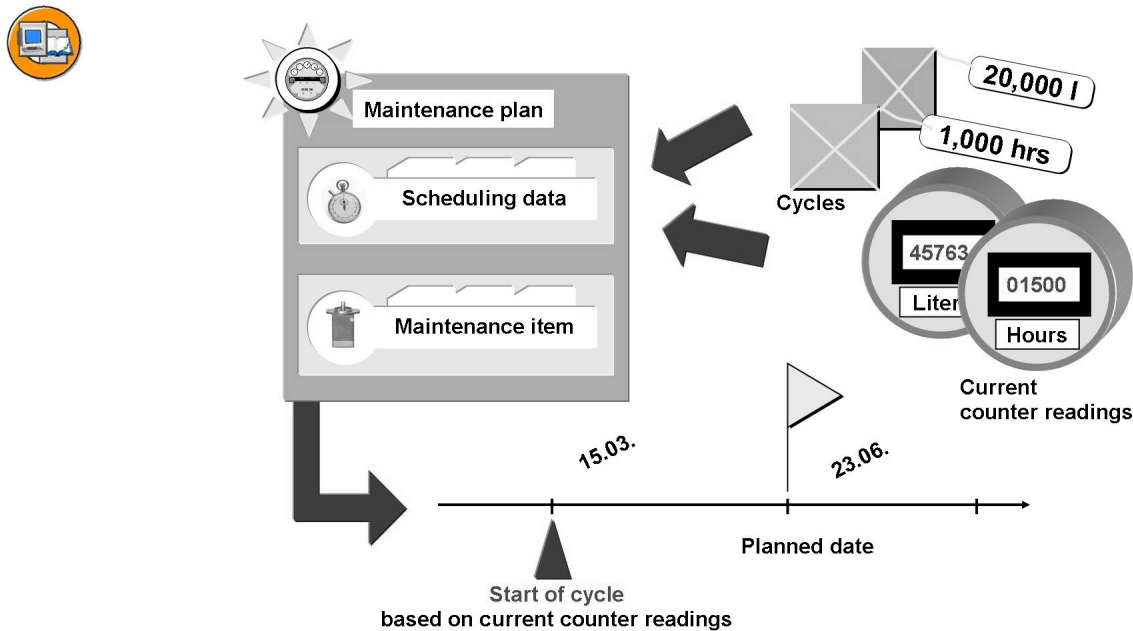


Figure 81: Starting a Multiple Counter Plan

The plan is started based on the current counter readings.

The first planned date is calculated on the basis of the date in the relevant measurement document. For the OR link type, the planned date is calculated based on the smaller interval arising from cycle and performance/day.



Caution: Perfect scheduling is only guaranteed if the following process flow is observed:

1. Generate order
2. Close order
3. Enter measurement document when order is closed (or enter measurement documents at regular intervals)
4. Reschedule maintenance plan

In contrast to the performance-based strategy plan, when you schedule the multiple counter plan, no high numbers of cycles occur for determining the new planned date. Instead, scheduling is always calculated from the current counter readings.

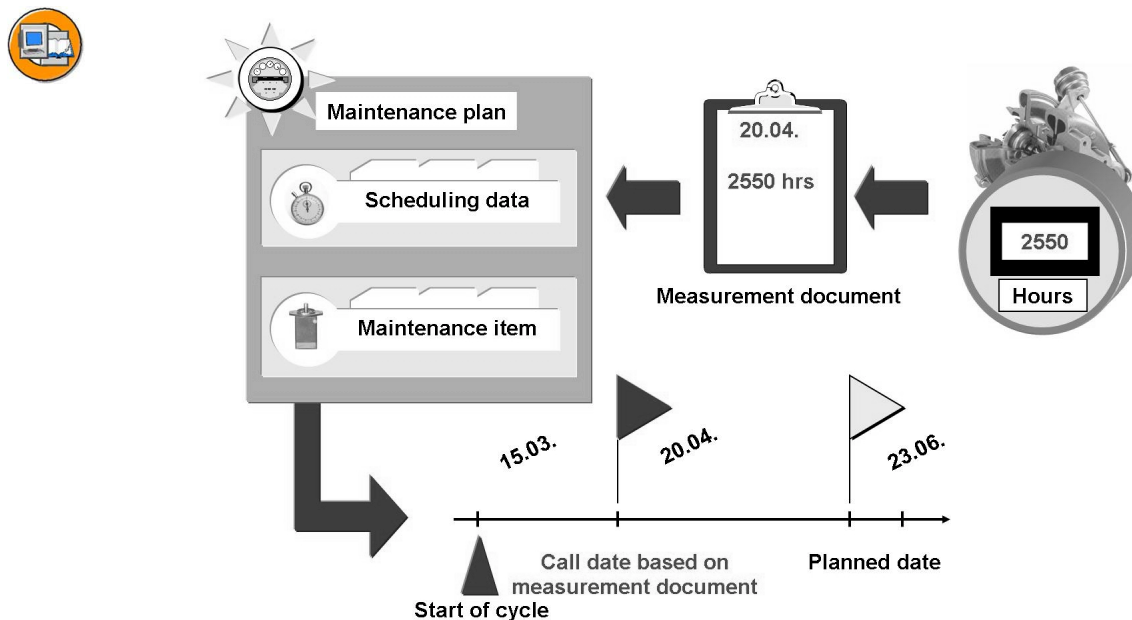


Figure 82: Enter measurement document

The actual call date is determined from the **measurement documents** entered, which record changes to the counter reading. If the **maintenance cycle** is due because of such a measurement document, the call is made immediately.

If the cycle is not due as a result of a measurement document being entered, the call is made on the planned date calculated.

Exercise 14: Multiple Counter Plan

Exercise Objectives

After completing this exercise, you will be able to:

- Create and schedule a multiple counter plan

Business Example

In the company, the performance-based maintenance of system parts with different capacity levels can be controlled using several characteristics.

For example, in the clarification plant, pumps that are used irregularly are maintained based on flow in liters and the number of operating hours.

Task:

Check the following for your equipment **TEQ-##**.

1. Which counters are available and what is the annual performance?

Make a note of the counter numbers.

Change the annual performance of the operating hours counter to **3650** hours.



Hint: Note that this exercise builds on exercise 11 *Counters and Measurement Documents*.

2. Enter an initial/new measurement document for both counters. How do you do this?

3. Display the cycle set ZS.

Which menu path do you use?

Continued on next page

Which cycles are defined?

What is the function of a cycle set?

What is the difference between a cycle set and a strategy?

4. Create a multiple counter plan.

Use the following data:

Cycle set	ZS
Equipment	TEQ-##
Task list	A PUMP_WTG 7
Operation type	OR

Which menu path do you use?

What maintenance plan number does the system assign?

5. Start the maintenance plan based on the current counter readings.

Which planned date is calculated?

6. Enter a counter reading that calls up a maintenance order for one of the counters.

Which counter reading have you entered and how high does it have to be?

Check the order generated by the maintenance plan.

Which order number does the system assign?

Release the order if necessary and technically complete it immediately.

Continued on next page

During the technical completion, enter two new counter readings for the flow in liters and operating hours counters. How do you do this?

7. Display the maintenance plan after the order has been technically completed.

What effect does the completion have?

Call the deadline monitoring function and reschedule the maintenance plan. How do you do this?

Check the situation for planned/call dates. What effect does the rescheduling have?

Solution 14: Multiple Counter Plan

Task:

Check the following for your equipment **TEQ-##**.

1. Which counters are available and what is the annual performance?

Make a note of the counter numbers.

Change the annual performance of the operating hours counter to **3650** hours.



Hint: Note that this exercise builds on exercise 11 *Counters and Measurement Documents*.

- a) **SAP Menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Change**

Button *Measuring Points/Counters*, and then *New entries*

Field name or data type	Values
Measuring point	Operating hours counter
Measuring point	Flow counter

Select measuring point *Operating hours counter* and choose *Measuring point* (in the detail view of the measuring point).

Field name or data type	Values
Annual performance	3650

Select measuring point *Flow counter* and choose *Measuring point* (in the detail view of the measuring point).

Field name or data type	Values
Annual performance	36500

Continued on next page

2. Enter an initial/new measurement document for both counters. How do you do this?

- a) *SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Measurement Documents → Create*

Field name or data type	Values
Measurement points	See above
Measurement time	Today's date or earlier
Counter reading	0

3. Display the cycle set ZS.
Which menu path do you use?
Which cycles are defined?
What is the function of a cycle set?
What is the difference between a cycle set and a strategy?

Continued on next page

- a) *SAP menu* → *Logistics* → *Plant Maintenance* → *Preventive Maintenance* → *Maintenance Planning* → *Maintenance Strategies* → *Cycle Sets* → *Display*

Field name or data type	Values
Cycle set	ZS
Cycle 1	Every 10,000 liters
Cycle 2	Every 1,000 operating hours

A cycle set is used as a **template** for cycles when you create a multiple counter plan. The cycles can be changed in the maintenance plan, without affecting the cycle set.

The difference between a **strategy** and **cycle set** is that a strategy always has cycles of the same dimension (for example, time), whereas a cycle set can have cycles of different dimensions (for example, time, liters, flow in liters).

A relationship also exists between a strategy and strategy plan, that is, if the strategy is changed, the strategy plans that refer to them change too. This relationship does not exist between a cycle set and a multiple counter plan.

4. Create a multiple counter plan.

Use the following data:

Cycle set	ZS
Equipment	TEQ-##
Task list	A PUMP_WTG 7
Operation type	OR

Which menu path do you use?

What maintenance plan number does the system assign?

Continued on next page

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Multiple Counter Plan*

Field name or data type	Values
<i>Maintenance plan</i>	Leave blank
<i>Maintenance plan category</i>	Plant maintenance
<i>Cycle set</i>	ZS
<i>Reference object</i>	TEQ-##
<i>Counters</i>	are determined from the reference object by choosing <i>Default Counter from Object</i> (F4 Help for Counter field)
<i>Task list - Type</i>	A
<i>TaskLstGrp</i>	PUMP_WTG
<i>Task list - GrpCr</i>	7

5. Start the maintenance plan based on the current counter readings.
Which planned date is calculated?

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule*

Edit → Start

Field name or data type	Values
<i>Planned date</i>	Date of the last measurement document + 100 days

6. Enter a counter reading that calls up a maintenance order for one of the counters.

Continued on next page

Which counter reading have you entered and how high does it have to be?

Check the order generated by the maintenance plan.

Which order number does the system assign?

Release the order if necessary and technically complete it immediately.

During the technical completion, enter two new counter readings for the flow in liters and operating hours counters. How do you do this?

- a) ***SAP menu → Logistics → Plant Maintenance → Management of Technical Objects → Equipment → Measurement Documents → Create***

The measurement document created must reach one of the planned counter readings so that an order is called.

SAP Menu → Logistics → Plant Maintenance → Maintenance Processing → Order → Order List → Change

Selection criteria: Status *Outstanding*, maintenance plan number

Select *Release order* if necessary, and then *Technical completion*.

After the order has been technically completed, the corresponding call is marked as completed in the maintenance plan. The completion date specified on completion is entered in the maintenance plan.



Hint: Use the *Enter measurement documents* button to enter a new measurement document for both counters.

7. Display the maintenance plan after the order has been technically completed.

What effect does the completion have?

Call the deadline monitoring function and reschedule the maintenance plan. How do you do this?

Check the situation for planned/call dates. What effect does the rescheduling have?

Continued on next page

-
- a) When the order is technically completed, the call is selected as completed.

***SAP menu → Logistics → Plant Maintenance → Preventive Maintenance
→ Maintenance Planning → Scheduling for Maintenance Plans →
Deadline Monitoring***

As a result of rescheduling, a new planned date has been calculated, based on the counter readings entered for the technical completion of the last order.



Lesson Summary

You should now be able to:

- Schedule a multiple counter plan



Unit Summary

You should now be able to:

- Describe the functions of the multiple counter plan
- Create a multiple counter plan
- Schedule a multiple counter plan

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Unit 7

Maintenance-Plan-Based Sales of Services

Unit Overview

This unit introduces the maintenance plan-based sale of services and explains detailed functions and the required Customizing settings.



Unit Objectives

After completing this unit, you will be able to:

- Describe the structure of the maintenance contract
- Create a maintenance plan on the basis of a maintenance contract

Unit Contents

Lesson: Brief Overview of the Maintenance Contract.....	212
Lesson: Maintenance Contract and Maintenance Plan.....	217
Exercise 15: Maintenance Contract and Maintenance Plan	219

Lesson: Brief Overview of the Maintenance Contract

Lesson Overview

This lesson provides a brief overview of the structure of a maintenance contract.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the structure of the maintenance contract

Business Example

The project team should first look at maintenance contracts with customers so that they can then create service orders for the respective customers automatically on the basis of the contract data.

Brief Overview: Maintenance contract

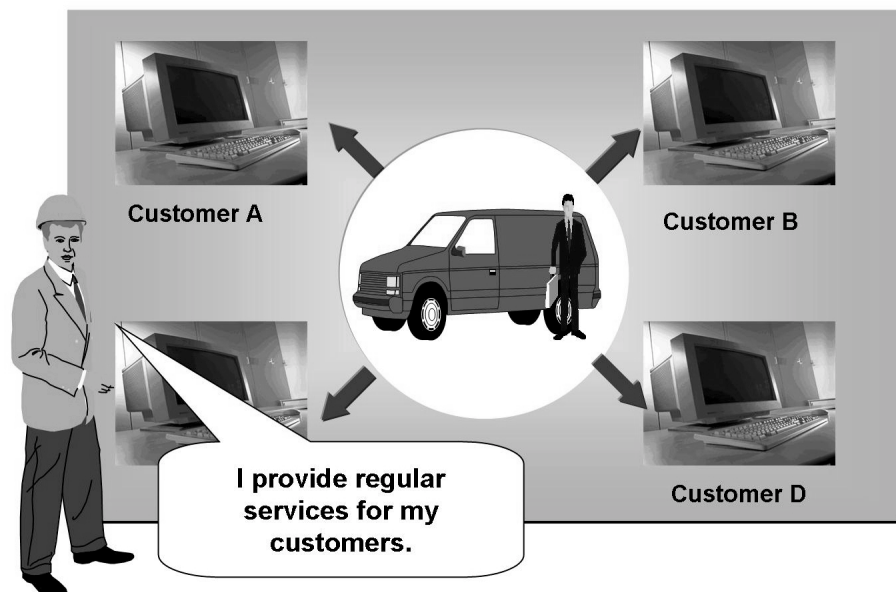


Figure 83: Business process for maintenance plan-based sales of services

You provide services for your customers regularly and want to ensure that when the service task is due, a service order (or notification) is called up with reference to the customer's maintenance contract.

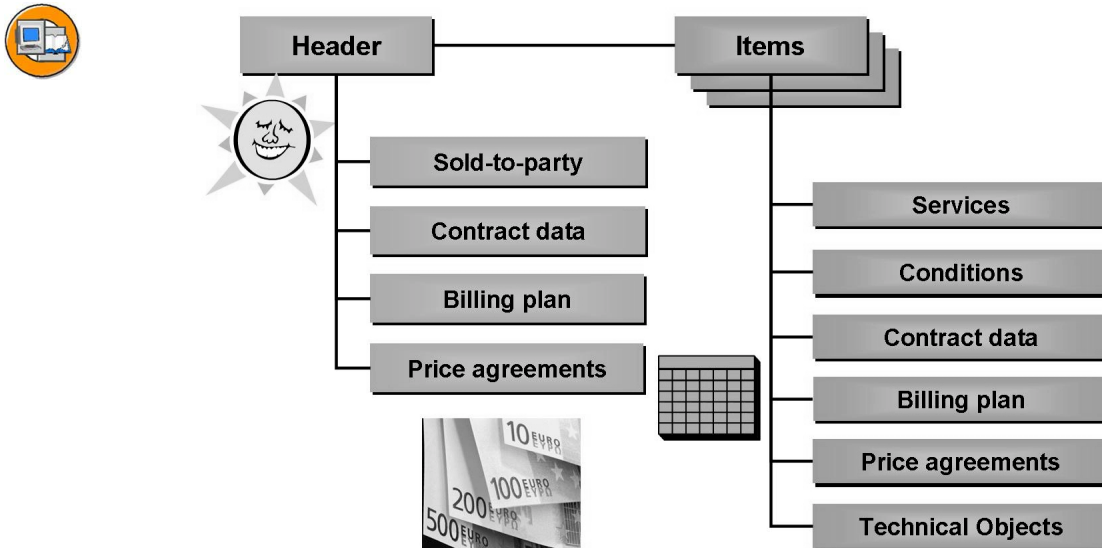


Figure 84: Structure of the maintenance contract

The service contract is a sales document.

In the standard settings, the sales document type “SM” (Service and Maintenance) is used.

The **contract header** contains the assignment to the sold-to-party and additional partner information. Contract data and price agreements can also be defined for the contract header. These are valid for all items, unless otherwise specified. The billing plan header is used to determine the settlement periods and billing dates for the billing plans of the items.

The **contract items** contain the service products and conditions. Contract data, a billing plan, and price agreements can also be defined at item level. The technical objects, at which services are performed, are likewise assigned at item level.

The following can be entered as **technical objects**: Functional locations, pieces of equipment (with or without an assembly) or serial numbers.

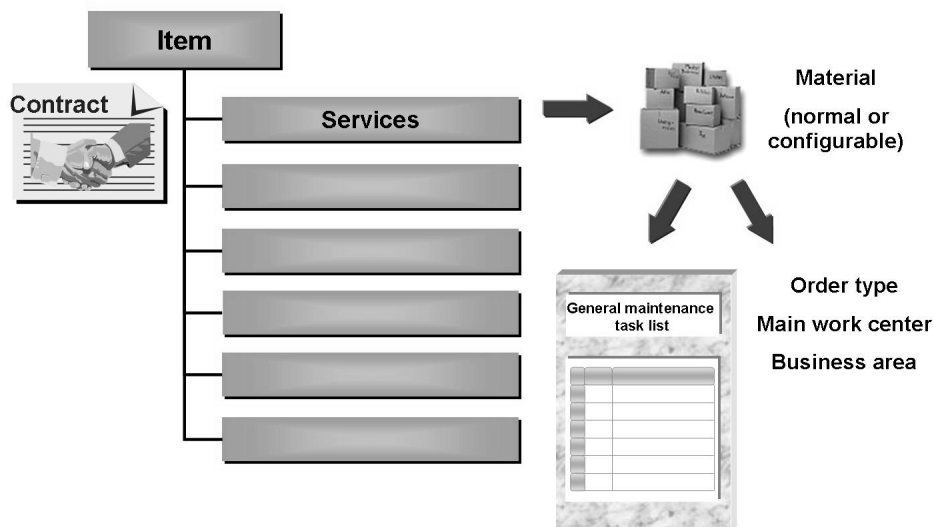


Figure 85: Material and General Maintenance Task List

The contract item contains services that are mainly specified as configurable materials. In addition to the data in the material master, the material contains a series of links. It refers to:

- General maintenance task list
- The work center responsible
- Order type
- Business area

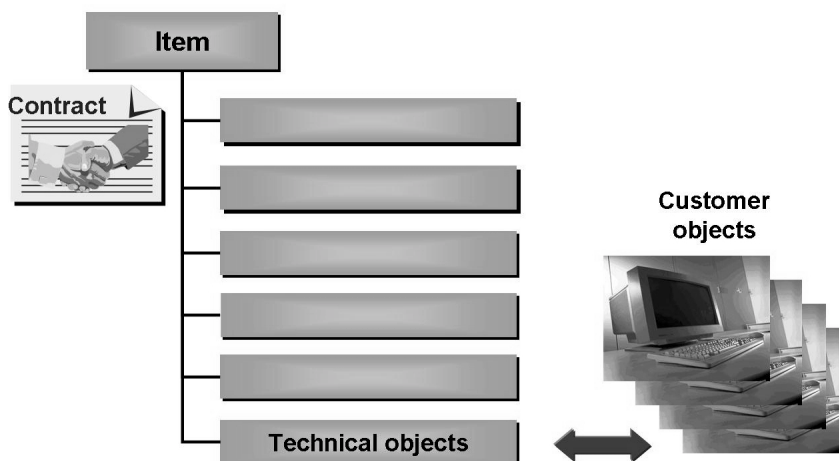


Figure 86: Contract Item and Technical Objects

The technical objects, for example, pieces of customer equipment, are assigned to the contract item.



Lesson Summary

You should now be able to:

- Describe the structure of the maintenance contract

Lesson: Maintenance Contract and Maintenance Plan

Lesson Overview

This lesson shows the link between the maintenance contract and maintenance plan.



Lesson Objectives

After completing this lesson, you will be able to:

- Create a maintenance plan on the basis of a maintenance contract

Business Example

The company offers services to its customers, which are recorded in the maintenance contract. The company wants to provide these on time, and supports the process using the automatic creation of service orders.

Maintenance Contract and Maintenance Plan

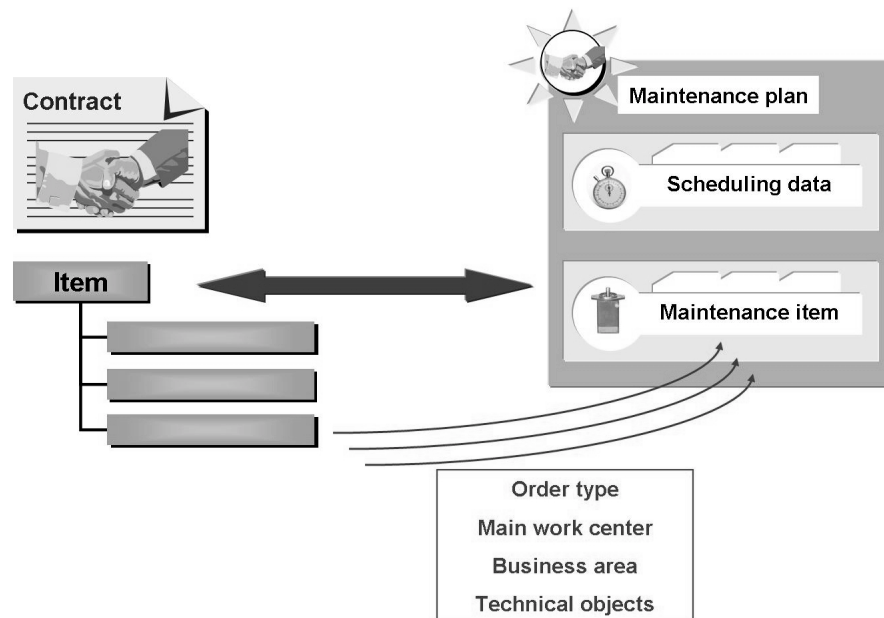


Figure 87: Link between maintenance plan and maintenance contract

You can create a maintenance plan with reference to a service contract item. You can use this maintenance plan category to simplify the processing of services that you have agreed in outline agreements for service objects.

When a maintenance plan is created with reference to a contract item, the system automatically copies certain data into the maintenance item. The **start date** is proposed from the contract item. If the service order is the call object for the maintenance plan, an object list is created as a reference to the **object list** for the contract.

The object list can only be changed in the contract item.

Default values are also copied into the maintenance item using the service product from the contract item.

Since you have assigned a **general task list** to the service product, the system obtains information about the maintenance plan type when a maintenance plan is created with the “Service order” call object. The strategy for the maintenance plan is determined using the maintenance strategy, which is specified in the general task list. If no strategy is specified in the general task list, a single cycle plan is created.

During **scheduling**, the system creates service notifications or service orders with reference to a contract.

Exercise 15: Maintenance Contract and Maintenance Plan

Exercise Objectives

After completing this exercise, you will be able to:

- Create and schedule a maintenance plan with reference to an item in a maintenance contract

Business Example

Your company services a series of its products based on maintenance contracts. A layered service concept is therefore offered for maintaining PCs. Before a service task becomes due, a service order is to be created automatically on time, with reference to the customer's maintenance contract. A maintenance plan that is linked to the item in the maintenance contract is used to this end.

Task:

You conclude a maintenance contract with your customer, Hi-Tech, covering regular inspections of its EDP equipment.

1. Display maintenance contract **40000087** and determine the following data:

<i>Sold-to party</i>	?
<i>Material</i>	?
<i>Duration</i>	?
<i>Technical Objects</i>	?

How do you do this?

2. To generate service orders for these maintenance tasks at regular intervals, create a maintenance plan for this maintenance contract.

Continued on next page

<i>Maintenance plan category</i>	Service order with contract
<i>Sales document</i>	40000087
<i>Item</i>	10
<i>Planning plant</i>	1200
<i>Cycle/Unit</i>	3 MON

Check the cycle start date and object list. What entries have been made?

3. Which task list has been assigned?

Why?

4. Save the maintenance plan.

What maintenance plan number does the system assign?

5. Schedule the maintenance plan with the following parameters:

<i>Call horizon</i>	0
<i>Scheduling period</i>	Duration of maintenance contract
<i>Completion requirement</i>	X
<i>Start of cycle</i>	Default value

Start the maintenance plan. How do you do this?

Continued on next page

Display the service orders generated by the maintenance plan and check whether operations and objects have been copied correctly. How do you do this?

6. Call the graphical maintenance scheduling overview for the maintenance plan created above.

Display the service dates for the duration of the maintenance contract. How do you do this?

Solution 15: Maintenance Contract and Maintenance Plan

Task:

You conclude a maintenance contract with your customer, Hi-Tech, covering regular inspections of its EDP equipment.

1. Display maintenance contract **40000087** and determine the following data:

<i>Sold-to party</i>	?
<i>Material</i>	?
<i>Duration</i>	?
<i>Technical Objects</i>	?

How do you do this?

- a) **SAP menu** → **Logistics** → **Customer Service** → **Service Agreements** → **Contracts** → **Contract** → **Display**

Field name or data type	Values
<i>Sold-to party</i>	1171
<i>Material</i>	INSPECTION_SERVICE
<i>Technical objects</i> (display using Extras → Technical Objects)	Maxitec-R 3100 personal computer with equipment numbers
<i>Duration</i>	01.01.20XX - 31.12.20XX (Item detail tab, select item and choose <i>display item details</i> , then select the <i>Contract data</i> tab)

2. To generate service orders for these maintenance tasks at regular intervals, create a maintenance plan for this maintenance contract.

Continued on next page

<i>Maintenance plan category</i>	Service order with contract
<i>Sales document</i>	40000087
<i>Item</i>	10
<i>Planning plant</i>	1200
<i>Cycle/Unit</i>	3 MON

Check the cycle start date and object list. What entries have been made?

- a) ***SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → For Contract Item***

The default contract start for the maintenance contract is the cycle start date (01.01.03).

The object list contains the technical objects from the contract item (see above).

3. Which task list has been assigned?

Why?

- a) Task list:

Field name or data type	Values
<i>Type</i>	A
<i>Task list group</i>	61
<i>Task list group counter</i>	1

4. Save the maintenance plan.

Continued on next page

What maintenance plan number does the system assign?

- a) The task list is assigned to the service product using the following path:

Logistics → Customer Service → Service Processing → Environment → Sales and Distribution → Service Products for Maintenance Plans

5. Schedule the maintenance plan with the following parameters:

<i>Call horizon</i>	0
<i>Scheduling period</i>	Duration of maintenance contract
<i>Completion requirement</i>	X
<i>Start of cycle</i>	Default value

Start the maintenance plan. How do you do this?

Display the service orders generated by the maintenance plan and check whether operations and objects have been copied correctly. How do you do this?

- a) ***SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule***

Edit → Start

Call scheduling of the maintenance plan again in scheduling mode (or display mode) and select the line *New start*, called in the list of scheduled calls and choose *Display call object* (glasses icon).

The task list and object list for the maintenance item have been copied into the service order (*Operations* and *Objects* tabs).

6. Call the graphical maintenance scheduling overview for the maintenance plan created above.

Continued on next page

Display the service dates for the duration of the maintenance contract. How do you do this?

- a) *SAP menu → Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Scheduling Overview and Simulation*

Field name or data type	Values
<i>From date</i>	01.01.20XX
<i>To date</i>	31.12.20XX
<i>With equipment</i>	X
<i>With maintenance plans</i>	X
<i>With orders</i>	X
<i>Maintenance plan</i>	As created above



Lesson Summary

You should now be able to:

- Create a maintenance plan on the basis of a maintenance contract



Unit Summary

You should now be able to:

- Describe the structure of the maintenance contract
- Create a maintenance plan on the basis of a maintenance contract

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Unit 8

Condition-Based Maintenance

Unit Overview

This unit provides a brief introduction to condition-based maintenance and describes the PM-PCS interface.



Unit Objectives

After completing this unit, you will be able to:

- Describe the connection to external systems.
- Describe the options for handling process data in the SAP System

Unit Contents

Lesson: Connection to a Process Control System230

Lesson: Connection to a Process Control System

Lesson Overview

This lesson provides an overview of the connection to external systems for carrying out condition-based maintenance.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the connection to external systems.
- Describe the options for handling process data in the SAP System

Business Example

The condition of certain chemical process plants is to be monitored. If a key figure exceeds a predefined limit value, breakdown maintenance should be triggered automatically.

Connection to process control system

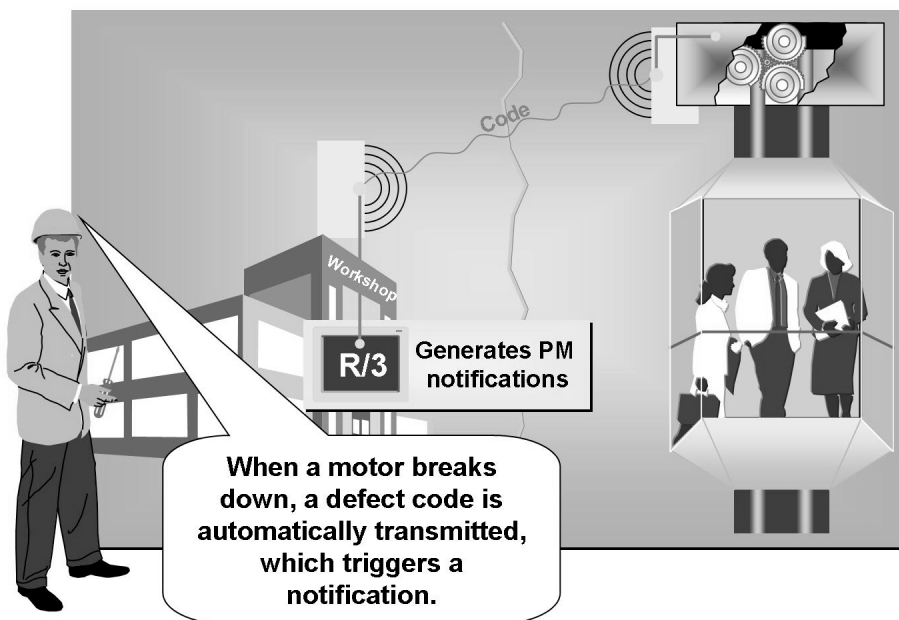


Figure 88: Condition-dependent maintenance business process

If the lift at your company breaks down, the repair is automatically triggered by the transmission of the current condition data. For example, if a motor in the lift breaks down, a specific malfunction code is transmitted, which triggers a corresponding notification in the SAP System.

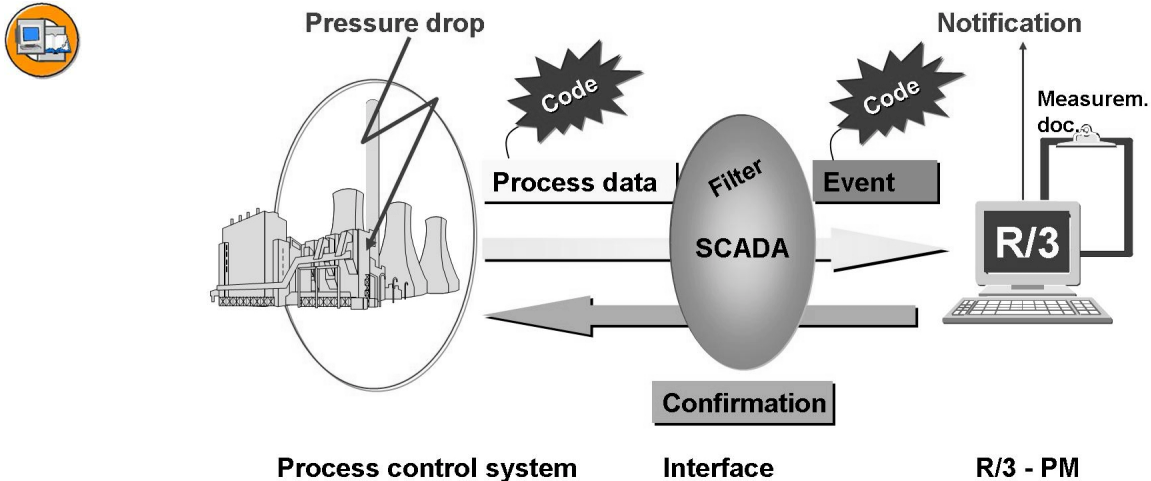


Figure 89: Connection to process control system

The objective of **condition-based maintenance** is an **online transfer** of condition data (measurement documents), which, under certain conditions, automatically results in tasks (notification) being triggered by the SAP System.

On the SAP side, communication is achieved through the **PM-PCS interface** (PM = Plant Maintenance; PCS = Process Control System), that is, the interface between the PM component of the SAP System and a remote process control system.

The advantages of online transfer (in contrast to the batch input procedure) are:

- Synchronous transmission and updating of condition data
- Creation of a measurement document
- Confirmation of the transaction to the notifying system
- Transmission of customer-specific data
- Automatic generation of notifications

Handling of process data

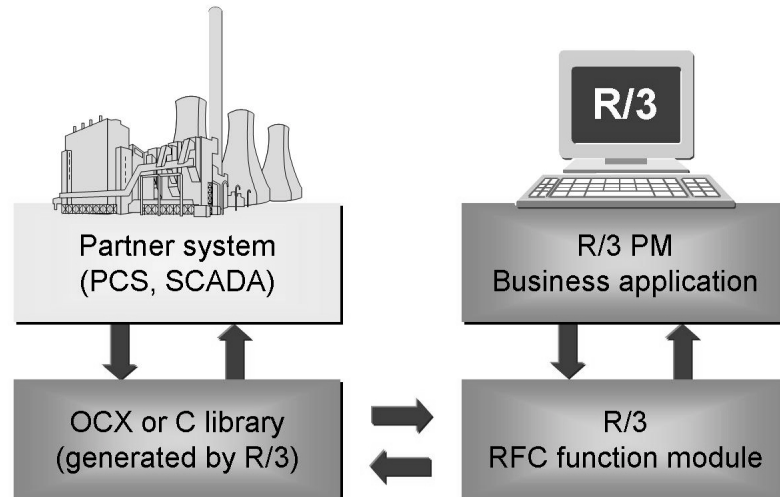


Figure 90: Communication Profile

Communication between the SAP System and the partner system is based on RFC modules (RFC = Remote Function Call).

The SAP System provides a series of RFC modules that form a defined interface for the transfer and editing of process data.

A client RFC module (C library) is generated within the SAP System. This module can then be implemented in the partner system and forms the interface to the SAP System.

The modules can be configured in such a way that when a tolerance value is exceeded, an event is triggered, which generates a notification in the PM component.

After the notification has been created, the current system condition can subsequently be displayed by the person responsible (customer exit).

All the necessary modules are contained in the standard SAP System.

The documentation for this interface is part of the SAP online documentation (under *Plant Maintenance > Technical Objects > PM-PCS Interface*).

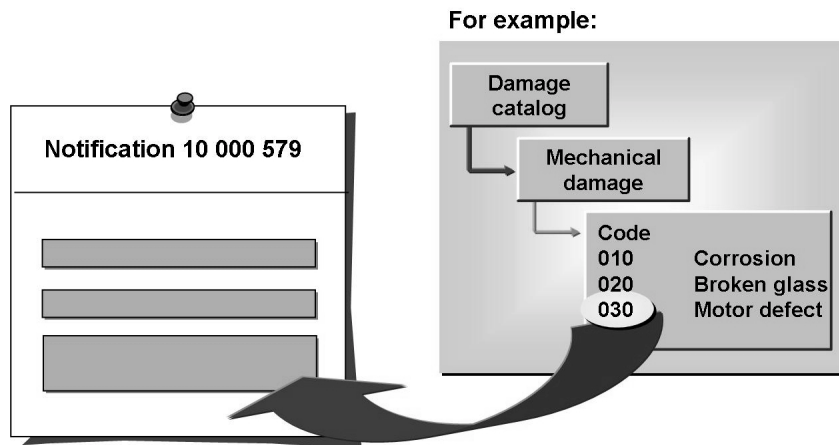


Figure 91: Notification with Code

With the appropriate configuration, the process data can be transferred together with **condition codes**.

If the condition codes for the external system have been matched with the codes in the PM component of the SAP System, the condition code transferred can be copied directly into the notification and record the appropriate damage.



Lesson Summary

You should now be able to:

- Describe the connection to external systems.
- Describe the options for handling process data in the SAP System



Unit Summary

You should now be able to:

- Describe the connection to external systems.
- Describe the options for handling process data in the SAP System

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Unit 9

Maintenance Plan-Based Test Equipment Management

Unit Overview

This unit provides an overview of maintenance plan-based test equipment management and describes the integration between Plant Maintenance and Quality Management.



Unit Objectives

After completing this unit, you will be able to:

- Describe the link between Plant Maintenance and Quality Management using the example of test equipment management.
- Make the settings for test equipment management

Unit Contents

Lesson: Processing of Test Equipment Management.....	238
Exercise 16: Processing of Test Equipment Management (Optional) ...	245
Lesson: Test Equipment Management Customizing	253

Lesson: Processing of Test Equipment Management

Lesson Overview

This lesson provides an overview of maintenance plan-based test equipment management.



Lesson Objectives

After completing this lesson, you will be able to:

- Describe the link between Plant Maintenance and Quality Management using the example of test equipment management.

Business Example

Test equipment in the company is to be subject to regular maintenance. The data obtained during maintenance work is to be processed further in Quality Management.

Processing of Test Equipment Management

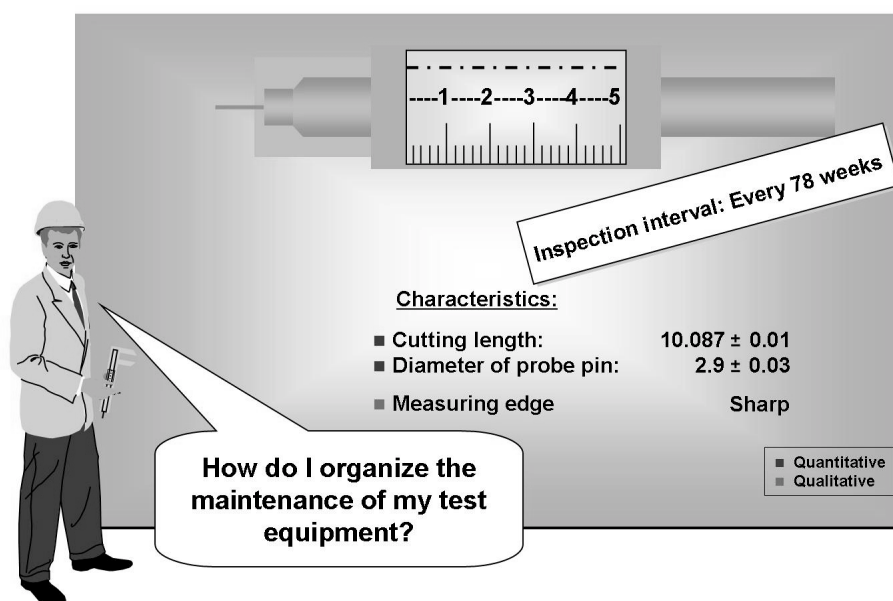


Figure 92: Maintenance plan-based test equipment management business process

In your company, the bathymetry gauge (depth measurement) should be checked regularly.

Planning and execution is performed using a maintenance plan that automatically generates an inspection lot. In the QM component, the measurement readings for the characteristics *Length* and *Diameter* of probe pin are entered for this inspection lot. If measurement readings lie outside of the tolerances, for example, where *adjustment* is necessary, the status of the gauge is changed accordingly and a malfunction report generated with the appropriate error code.

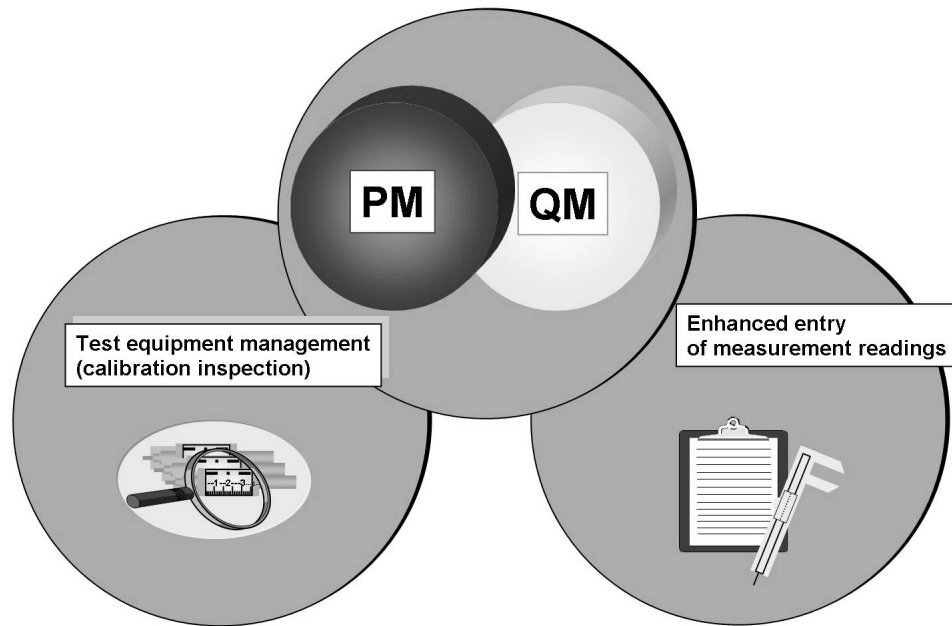


Figure 93: Integration of Plant Maintenance (PM) and Quality Management (QM)

The integration of Plant Maintenance and Quality Management is divided into two areas:

- Test equipment management (calibration inspection)
- Enhanced measurement reading entry

The integration of Plant Maintenance and Quality Management using **test equipment management** is shown in the following section.

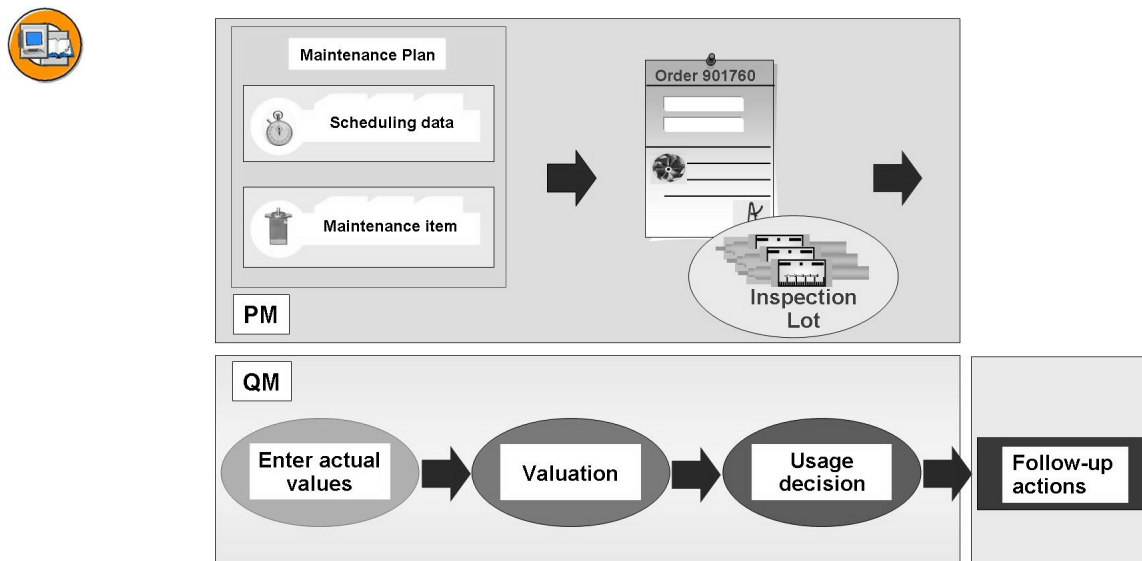


Figure 94: Process Flow

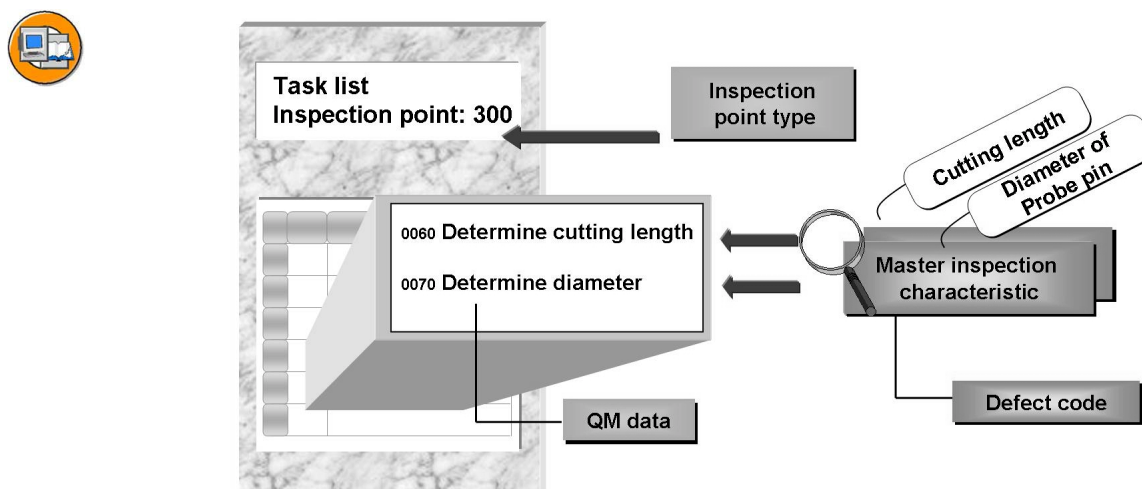


Figure 95: Task list

A **task list**, which contains all the inspection operations, is created for the work to be performed.

The inspection point type is set in the task list header.

The **master inspection characteristics** are assigned to the corresponding operations in the **task list**.

If the measurement readings are not to be updated, a general characteristic is assigned to the operation.

The inspection point completion is still defined in the **QM data** for the operation (for example, automatic valuation).

A **defect code** is assigned to the characteristic. The defect code is copied to the automatically generated **notification** if this characteristic is rejected during an inspection.

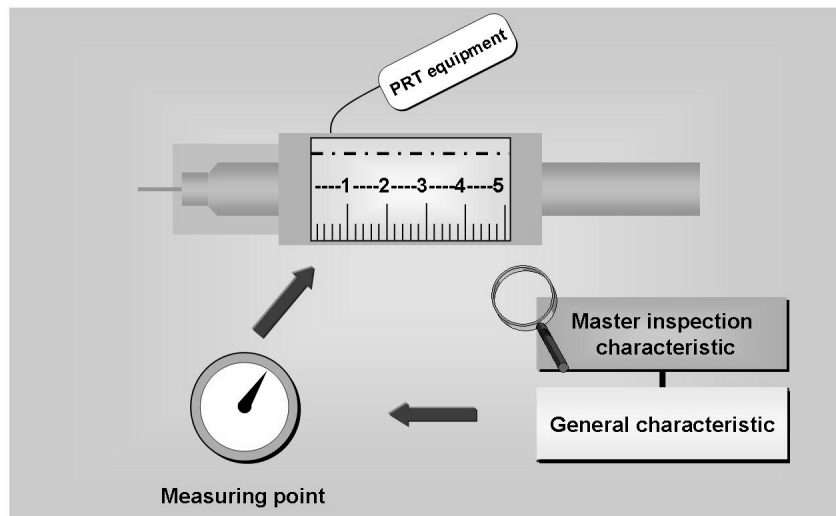


Figure 96: Characteristic Assignment for Tracking Measurement Readings

The test equipment to be checked must be created as **production resource/tool equipment**.

If the measurement readings are to be updated, a **measuring point** must be assigned to the equipment.

A general characteristic is assigned to the measuring point (defined in the class system).

In QM, a **master inspection characteristic** is created that references the general characteristic (and thereby produces the link to the measuring point).

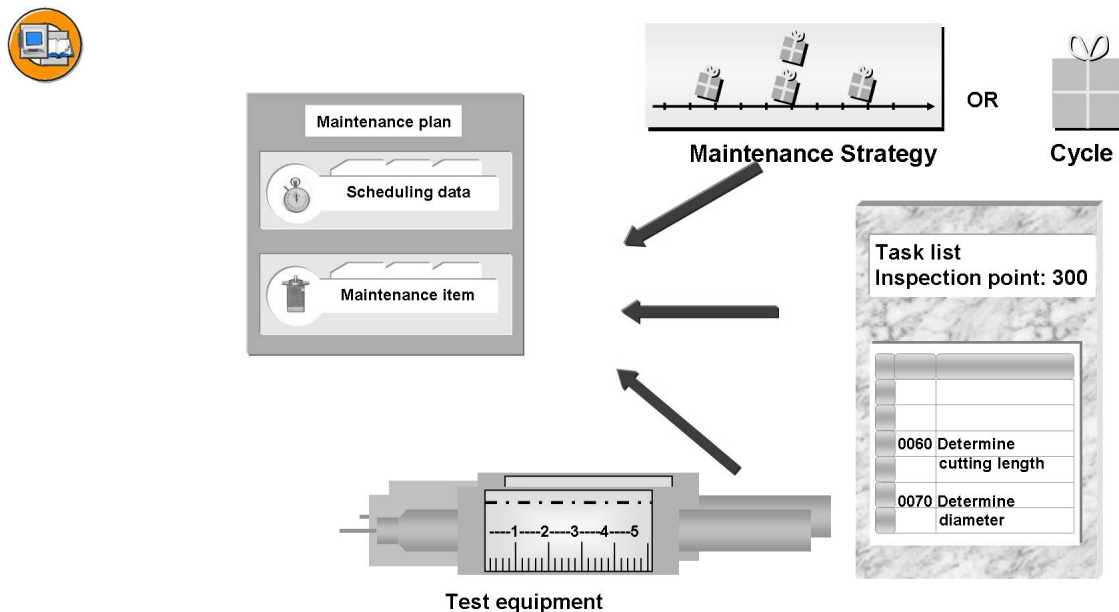


Figure 97: Maintenance plan

A **maintenance plan** is created for planning and monitoring inspection dates.

You can assign either a **maintenance strategy** or **cycle**, the previously created **task list** and one or more **objects** (test equipment) to the maintenance plan.

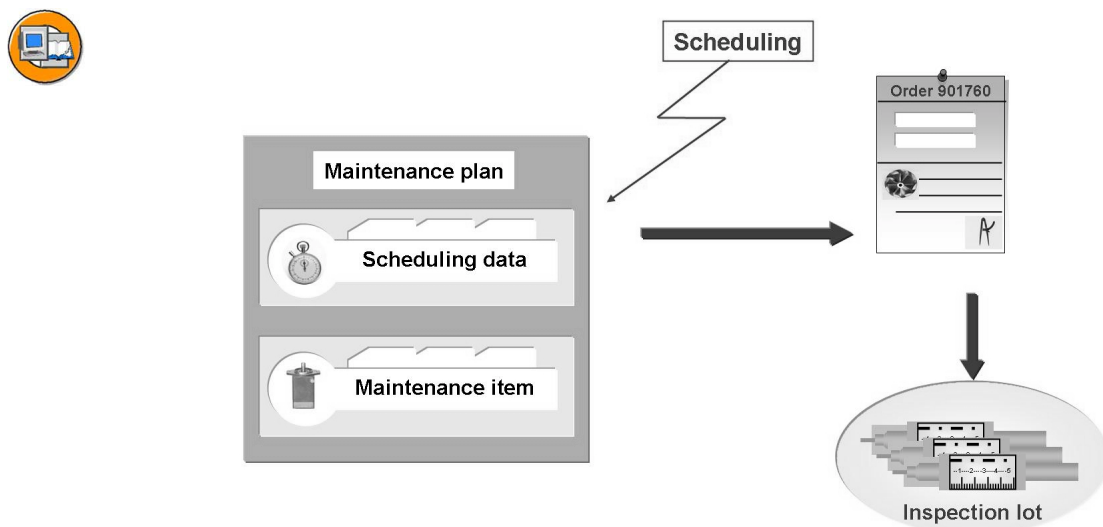


Figure 98: Generating an Inspection Lot

The maintenance plan is **scheduled** and thereby generates an **order with an inspection lot** when the order is released.

The important factor here is the **order type**, which is set in Customizing beforehand and represents the link between PM and QM. An automatic release can be preset for this order type.

The order is generated in **deadline monitoring** according to the **scheduling parameters** set in the maintenance plan.

You can also generate orders manually from the maintenance plan.

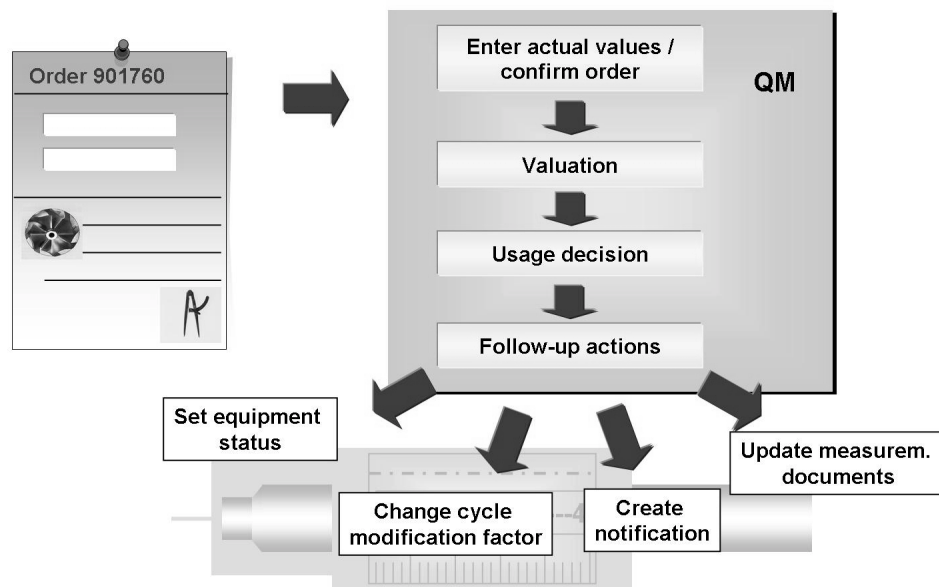


Figure 99: Processing in QM

The **measurement readings** resulting from the inspection are entered as an **inspection result** for the respective object and operation in QM. When the information is entered, these **actual values** are compared with the target values.

After the actual values have been entered, a **valuation** is made for the equipment:

The inspection completion follows the valuation.

A **usage decision** is made for the inspection lot based on the inspection results. This is achieved by entering predefined codes (UD codes).

You can assign a **follow-up action** to the UD code. The following scenarios are possible here:

- The actual values are within the tolerance range.
The equipment status is updated (for example, released for production).
- The actual values are **not** within the tolerance range.
One or more inspection characteristics are rejected. A malfunction report can be generated automatically, if required. In addition, the status of the object is set accordingly (for example, "Not usable - repair").

An adjustment of the **cycle modification factor** (lengthening or shortening of the cycle) and **updating of measurement documents** can also be triggered by the usage decision.

The advantage of using the enhanced entry of measurement readings lies in using certain functions from Quality Management:

- The **control chart** is a graphical means for the quality technician to regulate, analyze and document processes in production and other quality-relevant areas. Control charts were developed to differentiate systematic deviations from a target value in a characteristic (signals) from unavoidable random fluctuations of individual measurement readings (interference). The control chart hereby forms the core of **statistical process control** (SPC).
- The **histogram** is a graphical display of a frequency distribution as a bar chart and serves to simplify visualization of a data record. You can thereby identify typical and extreme values of a sample and assess location, range of dispersion, and form of distribution.
- The **run chart** is a graphical display of single values for a quantitative characteristic across a time axis.

Exercise 16: Processing of Test Equipment Management (Optional)

Exercise Objectives

After completing this exercise, you will be able to:

- Call a maintenance order with an inspection lot
- Enter the actual data for the inspection lot
- Enter a usage decision for the inspection lot

Business Example

A maintenance plan that generates maintenance orders with inspection lots is to be used to regularly monitor test equipment.

Within the PM-QM link, this should also provide the basis for further processing of the actual data determined in QM.

Task 1:

You want to carry out a calibration inspection at regular intervals for measurement equipment, and wish to use a maintenance plan for this purpose.

1. Create a new single cycle plan and incorporate the general maintenance task list for the calibration inspection. Create an object list with two pieces of test equipment.

Use the following data:

<i>Planning plant</i>	1000
<i>Planner group</i>	I##
<i>Order type</i>	PM06
<i>Main work center</i>	T-EL##
<i>Business area</i>	1000
<i>General maintenance task list/group counter:</i>	MM-CALIB / 1
<i>Pieces of equipment (in object list)</i>	10003540, 10003541
<i>Cycle</i>	3 months

Continued on next page

How do you do this?

Which additional entries are required?

What is the function of the order type in this scenario?

2. Schedule the maintenance plan for today's date.

How do you do this?

How can you determine the inspection lot number?

What is the origin of the inspection lot?

What is the status of the order?

3. It was determined during the calibration inspection that equipment 10003540 has both an invalid zero point deviation and an unacceptable full-scale deviation. The values for equipment 10003541 for both characteristics lie within the permitted tolerances.

Enter inspection results that are appropriate for this scenario.

How do you do this?

Which valuation do you make for both pieces of equipment?

Task 2:

After recording results and making the valuation, a usage decision that is linked to appropriate follow-on functions should be created for the inspection lot.

1. Make a usage decision for the inspection lot.

How do you do this?

Continued on next page

Which follow-on functions did you trigger and which were triggered automatically?

2. Check equipment 10003540.

What has changed?

Solution 16: Processing of Test Equipment Management (Optional)

Task 1:

You want to carry out a calibration inspection at regular intervals for measurement equipment, and wish to use a maintenance plan for this purpose.

1. Create a new single cycle plan and incorporate the general maintenance task list for the calibration inspection. Create an object list with two pieces of test equipment.

Use the following data:

<i>Planning plant</i>	1000
<i>Planner group</i>	I##
<i>Order type</i>	PM06
<i>Main work center</i>	T-EL##
<i>Business area</i>	1000
<i>General maintenance task list/group counter:</i>	MM-CALIB / 1
<i>Pieces of equipment (in object list)</i>	10003540, 10003541
<i>Cycle</i>	3 months

How do you do this?

Which additional entries are required?

What is the function of the order type in this scenario?

Continued on next page

-
- a) ***Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Maintenance Plans → Create → Single Cycle Plan***

No reference object is required.

The order type is responsible for generating the inspection lot (an inspection type for the order type is created in Customizing).

The order type must be configured so that the order generated is released immediately.

2. Schedule the maintenance plan for today's date.

How do you do this?

How can you determine the inspection lot number?

What is the origin of the inspection lot?

What is the status of the order?

- a) ***Logistics → Plant Maintenance → Preventive Maintenance → Maintenance Planning → Scheduling for Maintenance Plans → Schedule Edit → Start***

In the scheduling function, select *Sched. calls*; Select call and choose *Orders*;

Click on order number. In the order, select *Inspection lot* (to the right of the order short text).

Inspection lot number, for example, 140000000250

Status REL (Released), ILCR (Inspection lot created)

3. It was determined during the calibration inspection that equipment 10003540 has both an invalid zero point deviation and an unacceptable full-scale deviation. The values for equipment 10003541 for both characteristics lie within the permitted tolerances.

Enter inspection results that are appropriate for this scenario.

Continued on next page

How do you do this?

Which valuation do you make for both pieces of equipment?

- a) **Logistics → Quality Management → Quality Inspection → Worklist → Results Recording**

Inspection lot origin: 14 (Plant Maintenance)

Expand the relevant operation in the dialog structure (left column) and doubleclick the corresponding equipment for the inspection lot.

Both inspection characteristics appear on the entry screen.

Enter the actual values.

For example, Equipment **10003540**

Field Name or Data Type	Values
<i>Zero point deviation</i>	1 , 3
<i>Display on full scale</i>	100 , 5

Save and confirm the dialog box that appears - *Can be used with standard follow-up functions.*

For example, Equipment **10003541**

Field Name or Data Type	Values
<i>Zero point deviation</i>	1 , 7
<i>Display on full scale</i>	104 , 5

>> Save and confirm the subsequent dialog box *Cannot be used*

Task 2:

After recording results and making the valuation, a usage decision that is linked to appropriate follow-on functions should be created for the inspection lot.

1. Make a usage decision for the inspection lot.

Continued on next page

How do you do this?

Which follow-on functions did you trigger and which were triggered automatically?

- a) *Logistics* → *Quality Management* → *Quality Inspection* → *Inspection Lot* → *Usage Decision* → *Record*

The inspection lot last processed appears by default

(or enter inspection lot number)

Choose the relevant code in the *UD code* field (for example, **A** for **usable**) and save.

When you save the usage decision, the window for changing the status of objects and the cycle modification factor appears.

One response to the valuation of equipment 10003541 could be, for example, a reduction of the cycle modification factor, which results in the maintenance cycle being shortened.

A malfunction report (category MQ) was generated with two items (zero point error and end of scale error) and corresponding error codes.

Measurement documents were still generated for all the measurement readings.

2. Check equipment 10003540.

What has changed?

- a) Equipment **10003541** has been assigned the **status NPRT** (PRT not ready for use) as a result of the usage decision.



Lesson Summary

You should now be able to:

- Describe the link between Plant Maintenance and Quality Management using the example of test equipment management.

Lesson: Test Equipment Management Customizing

Lesson Overview

This lesson demonstrates Customizing for maintenance plan-based test equipment management from a maintenance point of view.



Lesson Objectives

After completing this lesson, you will be able to:

- Make the settings for test equipment management

Business Example

Test equipment in the company is to be subject to regular maintenance. The data obtained during maintenance work is to be processed further in Quality Management. For this, Customizing settings in Plant Maintenance and Quality Management must be matched to each other.

Customizing

- **Order type**
In PM Customizing, an order type must be created for the calibration inspection.
- **Assign the inspection type to the order type**
In PM Customizing, the order type for the calibration inspection must be assigned to the previously defined inspection type for Plant Maintenance.
- **Inspection point**
In QM Customizing, an inspection point of category "Equipment" or "Functional location" must be defined. The inspection point is entered in the task list header.
- **Control key**
In QM Customizing, a control key that expects an inspection characteristic must be created for the task list.
- **Follow-up actions**
In QM Customizing, follow-up actions can be defined that can then be linked to the codes for usage decisions. If a particular code is assigned when the usage decision is made, the assigned follow-up actions, (for example, updating measurement readings, status changes and so on) are executed automatically.



Lesson Summary

You should now be able to:

- Make the settings for test equipment management



Unit Summary

You should now be able to:

- Describe the link between Plant Maintenance and Quality Management using the example of test equipment management.
- Make the settings for test equipment management

Internal Use SAP Partner Only

Internal Use SAP Partner Only

Internal Use SAP Partner Only

Internal Use SAP Partner Only



Course Summary

You should now be able to:

- Create task lists
- Create and schedule time-dependent and performance-dependent maintenance plans
- Make the Customizing settings required for task lists and maintenance planning

Appendix 1

Exercise Data and Customizing Paths

Exercise data

Description	Training System	IDES
General		
Controlling area:	1000	1000
Company code:	1000	1000
Plant:	1000	1000
Storage location:	0001	0001
Purchasing organization:	1000	1000
G/L account:	417000	417000
Vendors:	1000, 1101, 1102 SRV-1	1000
Technical Objects		
Equipment	TEQ-##	P-1000-N001
Equipment with synchronization Serial number and material/construction type synchronous	TEX-##	-
Inspection equipment	10003540, 10003541	10003540, 10003541

Description	Training System	IDES
Equipment with equipment BOM	T-SM0100 – T-SM0120	
Configurable equipment	P-6000-N001	P-6000-N001
Functional locations	K1, ## (*), SERV-PRO-RZ-##	K1, SERV-PRO-RZ-##
Operating hours counter for FL ->K1-M01-2, K1-M01-3, K1-M02-2, K1-M02-3	Created in course	
Status profile for equipment	PMSTAT	
Materials and Bills of Material		
Materials:		
Pump without serial number – standard price batches	T-FP1##	P-2001
Pump with serial number – standard price batches	T-FP2##	P-2002
Pump with serial number – moving average price batch	T-FP3##	P-2003
Material with serial profile PM2 (synchronous equip./serial number)	T-FP400	-
Pump without serial number – moving average price batch	T-FP9##	P-2009
Material with condition-based valuation (standard price valuation)	P-2001	P-2001

Description	Training System	IDES
Serial number profile (stock check = 1 > warning)	PM1	PM1
Synchronous equip./serial number	PM2	-
Configurable material	P-6000	P-6000
Bill of material for material P-6000	P-6000	P-6000
Materials for material BOM P-1000 (plant 1000, usage 4)	100-100 100-400 DG-1000 100-600 100-431 KR117185 WL-1000 G-1000 M-1000	100-100 100-400 DG-1000 100-600 100-431 KR117185 WL-1000 G-1000 M-1000
Materials for equipment BOM, T-SM0100 – T-SM0120, (plant 1200, usage 4)	DPC9021 C-1112 R-1120 R-1131 R-1160	DPC9021 C-1112 R-1120 R-1131 R-1160
Configurable material (service)	INSPECTION_SERVICE	
Work centers		
Work centers	T-ME##	Mechanics
	T-EL##	Electrics

Description	Training System	IDES
	T-EX##	
Task Lists and Maintenance Planning		
Task lists:	PUMP_WTG PUMP_REP MM-CALIB	PUMP_WTG PUMP_REP MM-CALIB
Profile	0000001	0000001
Maintenance plans	50	50
Service procurement	6000000000000	6000000000000
PM/QM link	51, 52	51, 52
Maintenance strategy (performance-based)	DFL	DFL
Cycle set	ZS	ZS
Configurable general task list for maintenance planning in conjunction with configurable equipment	PUMP_WTG 6	PUMP_WTG 6, (old status)
Maintenance plan with configurable equipment and configurable general task list	Maintenance plan 80	
Notification and Order Processing		
Service masters	100131, 100132	100131, 100132
Order type for generating inspection lots	PM06	PM06
Control key for internal service processing	PM05	PM05
Standard text keys	PM00001 – PM00008	PM00001 – PM00008

Description	Training System	IDES
Settlement profile for refurbishment (for order type PM04)	PM_AWA	
Order type for investment orders	PM07	
Service masters for internal service processing (control key PM05)	100020, 100021	
Cost Centers and Activity Types		
Cost centers		
Installed	4300	4300
Technical systems	4110	4110
External company	4350	4350
Activity types	1410 (repair)	1410 (repair)
	1610 (external)	1610 (external)
Allocation cost element for activity type 1610		
Outline Agreements / Framework Orders		
Outline agreement		
Pipe laying work (vendor 1101)	4600000024	4600000024
Framework order for services	4500006496	4500006496
Service		
Maintenance contract	40000084	40000084
Configurable material (service)	INSPECTION_SERVICE	
Sold-to-party	1171	

Description	Training System	IDES
Classes		
Variant class (used in configurable equipment and configurable general task list)	CL_P600	CL_P600
Project and Investment Program		
Project	I/5001	I/5001
Maintenance project profile	PM00001	PM00001
Investment program	PM-INV	PM-INV

To access Customizing go to:

SAP Menu → **Tools** → **Customizing** → **IMG** → **Execute Project**

Button *SAP Reference IMG*

Task lists

	Path
Define task list usage	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Task Lists → General Data → Define Task List Usage</i>
Profile	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Task Lists → Control Data → Define Profiles with Default Values</i>
Free material assignment	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Task Lists → Control Data → Define Presetting for Free Assignment of Material</i>
Control key	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Task Lists → Operation Data → Maintain Control Keys</i>

User fields	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Task Lists → Operation Data → Define User Fields</i>
List processing	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Task Lists → Set List Editing for Task Lists</i>
Preset list display	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Task Lists → Presetting for List Display of Multi-Level Task Lists</i>

Maintenance plans

Field Name or Data Type	Path
Maintenance plan categories	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Maintenance Plans → Set Maintenance Plan Categories</i>
Completion data	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Maintenance Plans → Set Maintenance Plan Categories</i>
Number ranges	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Maintenance Plans → Define Number Ranges for Maintenance Plans</i>
Sort fields	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Maintenance Plans → Define Sort Fields for Maintenance Plan</i>
Field selection	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Maintenance Plans → Define Field Selection for Maintenance Plan</i>

List processing	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Maintenance Plans → Set List Editing for Maintenance Plans</i>
Parameters for graphical maintenance scheduling overview	<i>Plant Maintenance and Customer Service → Maintenance Plans, Work Centers, Task Lists and PRTs → Maintenance Plans → Set List Editing for Maintenance Plan Overall Overview</i>
PM-QM: Order type	<i>Plant Maintenance and Customer Service → Maintenance and Service Processing → Maintenance and Service Orders → Functions and Settings for Order Types → Configure Order Types</i>
PM-QM: Inspection type for order type	<i>Plant Maintenance and Customer Service → Maintenance and Service Processing → Maintenance and Service Orders → Functions and Settings for Order Types → Assign Inspection Types to Maintenance/Service Order Types</i>
PM-QM: Inspection point	<i>Quality Management → Quality Planning → Inspection Planning → General → Define Identifier for Inspection Points</i>
PM-QM: Control key	<i>Quality Management → Quality Planning → Inspection Planning → General → Define Control Keys for Inspection Points</i>
PM-QM: Follow-up actions	<i>Quality Management → Quality Inspection → Inspection Lot Completion → Define Follow-Up Actions</i>

Feedback

SAP AG has made every effort in the preparation of this course to ensure the accuracy and completeness of the materials. If you have any corrections or suggestions for improvement, please record them in the appropriate place in the course evaluation.